Atop ABLELink® Ethernet-Serial Server GW21C-MAXI

User Manual

Version 1.1

Updated on 2004/03/5

Tel: 886-3-5508137

Fax: 886-3-5508131

www.atop.com.tw

IMPORTANT ANNOUNCEMENT

The information contained in this document is the property of Atop Technologies, Inc. and is supplied for the sole purpose of the operation and maintenance of products of Atop Technologies, Inc. No part of this publication is to be used for any other purposes, and it is not to be reproduced, copied, disclosed, transmitted, stored in a retrieval system, or translated into any human or computer language, in any form, by any means, in whole or in part, without the prior express written consent of Atop Technologies, Inc.

Published by

Atop Technologies, Inc.

2F, No. 146, Sec. 1, Tung-Hsing Rd.

Jubei City, Hsinchu 302

Taiwan, R.O.C.

Tel: 886-3-5508137

Fax: 886-3-5508131

www.atop.com.tw

Copyright © 2004 Atop Technologies, Inc. All rights reserved.

All other product names referenced herein are registered trademarks of their respective companies.

FCC WARNING

Class A for Ethernet-Serial Server (Model GW21C-MAXI)

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord can be used.

Use only shielded cables to connect other devices to this equipment by RS-232 / RS-485 ports.

Be cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Contents

1. INTRODUCTION 5
1.1 PACKAGING 5
1. 2 APPLICATION CONNECTIVITY 6
2. NOMENCLATURE AND SETTINGS 8
2.1 NOMENCLATURE OF GW21C-MAXI COMPONENTS 8
2.2 MODE SWITCH 8
3. HARDWARE INSTALLATION 9
3.1 CONFIGURATION 9
3.2 ASSIGNING A NEW IP ADDRESS BY ARP COMMAND 9
3.3 TCP/IP PORT NUMBER 10
4. SOFTWARE CONFIGURATION 11
4.1 CONFIGURATION SET BY MONITOR.EXE UTILITY 11
4.2 CONFIGURATION SET BY TELNET UTILITY 11
4.3 CONFIGURATION SET BY HYPER TERMINAL CONSOLE UTILITY 19
4.4 CONFIGURATION SET BY WEB BROWSER 20
4.5 VIRTUAL COM MODE 26
4.5.1 Setup of a virtual COM driver 26
4.5.2 Virtual COM communication 27
5. SNMP SETUP 31
5.1 SNMP NETWORK MANAGEMENT PLATFORM 31
5.2 USING NETWORKVIEW AS AN EXAMPLE 31
6. START WRITING YOUR OWN APPLICATIONS 33
6.1 PREPARING THE SYSTEM 33
6.2 RUNNING THE SAMPLE PROGRAM 33
TCPTEST in Visual Basic 33
TCPTEST2 in Visual C 34
7. DIAGNOSTICS 36
7.1 USE STANDARD TCP/IP UTILITY *PING* COMMAND 36
7.2 USE MONITOR.EXE CONFIGURATION UTILITY PROGRAM 36
7.3 USE TCPTEST.EXE OR TCPTEST2.EXE SAMPLE PROGRAM 37

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

APPENDIX A: GW21C-MAXI ETHERNET-SERIAL SERVER SPECIFICATIONS ... 38
A.1. HARDWARE SPECIFICATIONS ... 38
A.2. SOFTWARE SPECIFICATIONS ... 39
A.3 CONNECTOR PIN ASSIGNMENTS ... 39
A.3.1 COM Port ... 39
A.3.2 Ethernet Port (RJ-45) ... 41
A.3.3 Power terminal block connector ... 42
A.4 BUZZER/LED MESSAGE ... 42
Buzzer ... 42
LAN LED ... 42
COM Port LED ... 43
RUN LED ... 43
APPENDIX B. UPGRADE SYSTEM SOFTWARE ... 44
B.1 UPGRADE PROCEDURES ... 44
B.2 CRITICAL ISSUES OF UPGRADING ... 45
B.3 ERROR MESSAGES ... 45
APPENDIX C. HARDWARE CONFIGURATION ... 46
C.1 DISABLE SYSTEM FIRMWARE ... 46
APPENDIX D CONFIGURATION UTILITY ... 47
D.1 RUN THE UTILITY ... 47
D.2 DETECT OPERATIONAL DEVICES ... 47
D.3 CONFIGURE DEVICES ... 47

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

1. Introduction

The Atop GW21C-MAXI Ethernet-Serial Server is a gateway between Ethernet (TCP/IP) and RS-232/RS-485 communications. The information transmitted by GW21C-MAXI is transparent to both host computers (Ethernet) and devices (RS-232/RS-485). Data coming from the Ethernet (TCP/IP) is sent to the designated RS-232/RS-485 port and data being received from RS-232/RS-485 port is sent to the Ethernet (TCP/IP) transparently.

In the computer integration manufacturing or industrial automation area, the Atop GW21C-MAXI Ethernet-Serial Server is used for field devices to direct connect to Ethernet network. Terminal Server (main control program run in GW21C-MAXI) transforms whatever data received from RS-232/RS-485 to TCP/UDP port then connect devices to the Ethernet network via a single application program or multiple application programs.

Many control devices provide the ability to communicate with hosts through RS-232/RS-485 however RS-232/RS-485 serial communication has its limitations. For one, it is hard to transfer data through a long distance. With Atop GW21C-MAXI, it is possible to communicate with a remote device in the Intranet environment or even in the Internet and thus, increases the communication distance dramatically.

GW21C-MAXI from Atop Technologies Inc. offers one RS-232/ RS-485 port, one RJ45 Ethernet and Watch-Dog Timer etc.

1.1 Packaging

Atop Ethernet-Serial Server x 1

Atop Ethernet-Serial Server quick start guide x 1

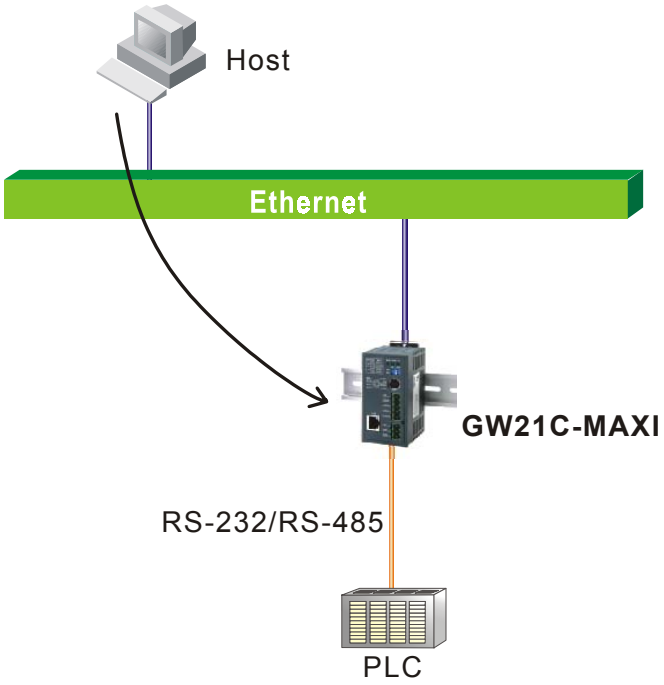
Mini DIN to RS-232 DB-9 Cable x 1

Product CD containing configuration utility and sample programs x 1

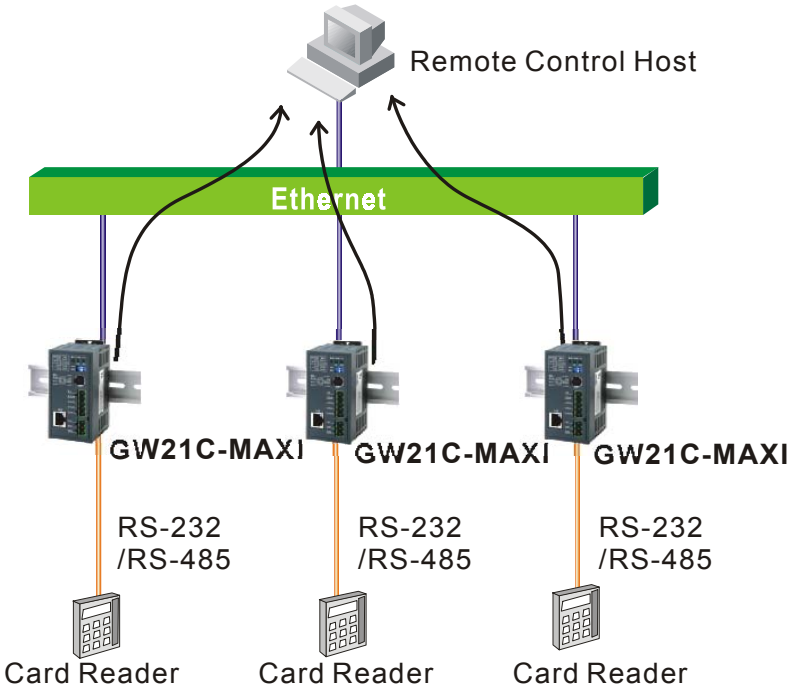
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

1. 2 Application Connectivity

TCP Server mode

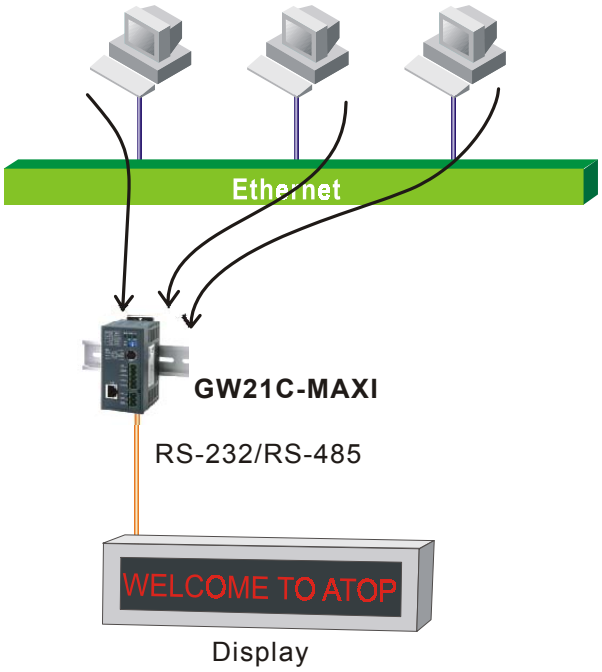


TCP Client mode

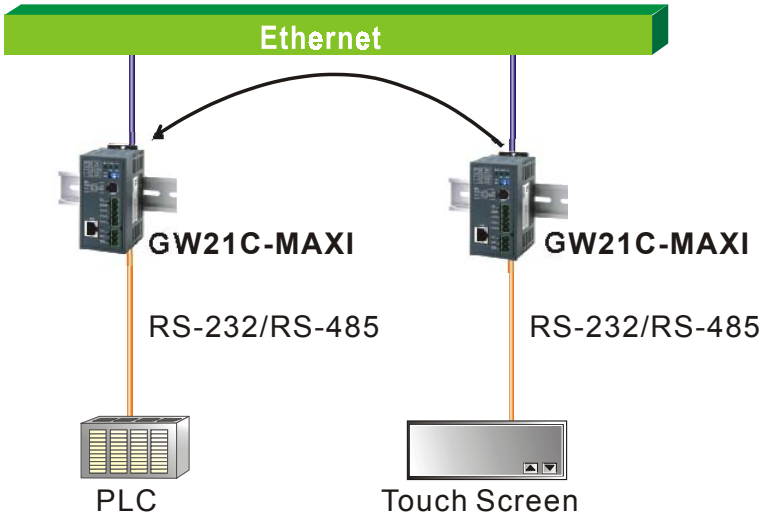


Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

UDP mode



Tunneling mode



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

2. Nomenclature and Settings

2.1 Nomenclature of GW21C-MAXI Components

Figure 2.1 shows the names of GW21C-MAXI components. In the figure, the indicated switch settings represent factory settings.

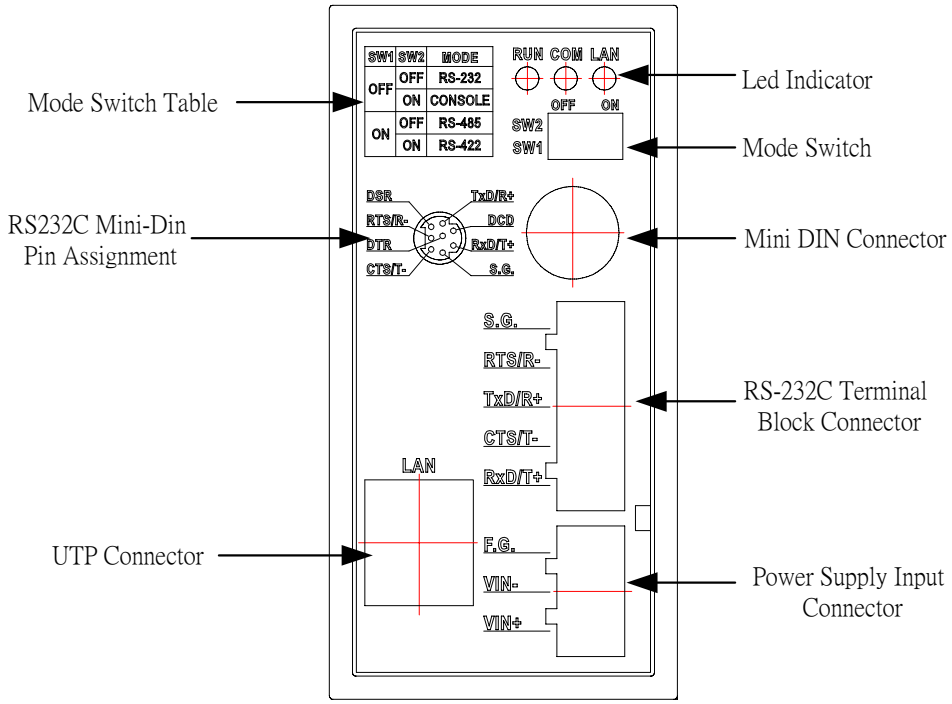


Figure 2.1. Nomenclature of GW21C-MAXI components.

2.2 MODE Switch

This sets or initializes the operating mode for the GW21C-MAXI.

The factory default setting is that Switch 1 (SW1) and Switch 2 (SW2) are set to OFF. You can use the Mode switch to change the operating mode from the factory default settings to your desired mode.

GW21C-MAXI can be setup either RS-232, RS-485, RS-422 or Console configuration mode by MODE Switch.

SW1	SW2	Mode
OFF	OFF	RS-232
	ON	CONSOLE
ON	OFF	RS-485
	ON	RS-422

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

3. Hardware Installation

- Prepare necessary cables, hub, power cord and RS232/RS485 connector.
- Connect GW21C-MAXI to Ethernet network via hub/switch or direct connect to host computer through cross over cable.
- Connect a serial device to a serial port of GW21C-MAXI, make sure the right connection of either RS-232 or RS-485.
- Plug in DC9-30V, the buzzer will beep and the RUN LED will blink if GW21C-MAXI functions normally. Please refer to Appendix A.4 to see all of LED messages.
- Use **monitor.exe** configuration utility in the product CD or diskette to diagnose GW21C-MAXI. If it starts up successfully, you are able to find the IP and MAC addresses of GW21C-MAXI. You can change the network parameters of GW21C-MAXI to join your LAN by changing its IP address, gateway IP address and subnet mask.

3.1 Configuration

Atop GW21C-MAXI Ethernet-Serial Server is shipped with default settings shown in the following table:

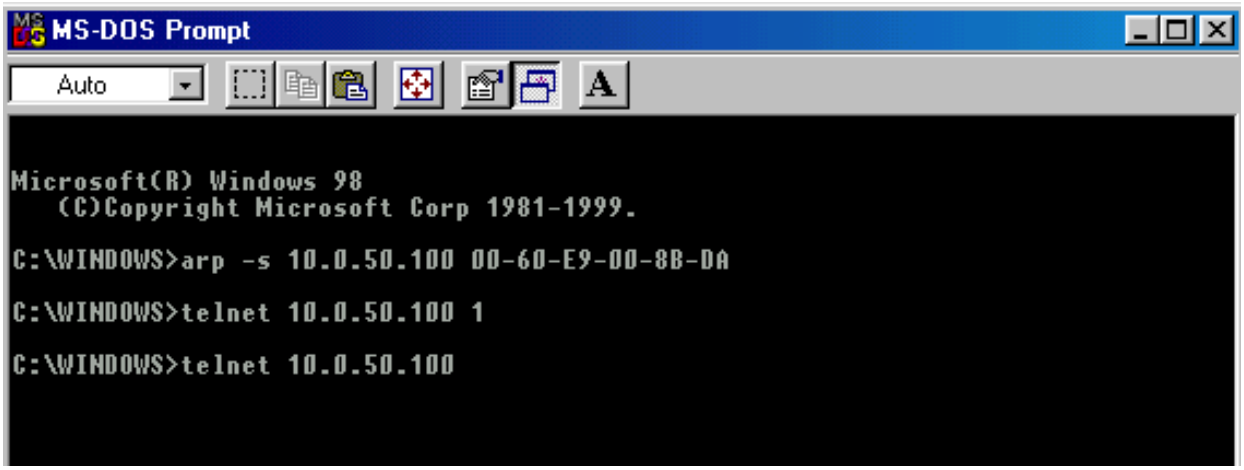
Property	Default Value
IP Address	10.0.50.100
Gateway	10.0.0.254
Subnet Mask	255.255.0.0
User Name	admin
Password	Null
COM 1	9600,None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms
Link 1	Type: TCP Server, Listen port 4660, Filter=0.0.0.0, Virtual COM disabled
SysName of SNMP	name
SysLocation of SNMP	location
SysContact of SNMP	contact

Note: Atop provides a reset button to restore system settings including IP address, gateway IP address and subnet mask etc. to the defaults. Press and hold the reset button for 5 seconds till the server reboots.

3.2 Assigning a new IP Address by ARP command

ARP –s is used to assign a static IP address of GW21C-MAXI and add this static entries to the ARP cache of the computer, when TCP/IP packet with destination port number 1 is sent to GW21C-MAXI, it causes the device to check its MAC address with IP address, once GW21C-MAXI finds those two unmatched, it will reboot and change to the new IP address which was set by ARP –s command. The following example uses ARP to assign a static IP address of GW21C-MAXI using its MAC address printed on the label of the rear panel, then use Telnet to send the TCP/IP packet with destination port number 1 to GW21C-MAXI, after GW21C-MAXI reboots it will change its IP address to the new one.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



Notes:

1. Arp command can only be used to set a static IP address of GW21C-MAXI using system default user name admin and default password null.
2. Only TCP/IP packet with destination port number 1 will lead GW21C-MAXI to reboot and change the IP address.

3.3 TCP/IP Port Number

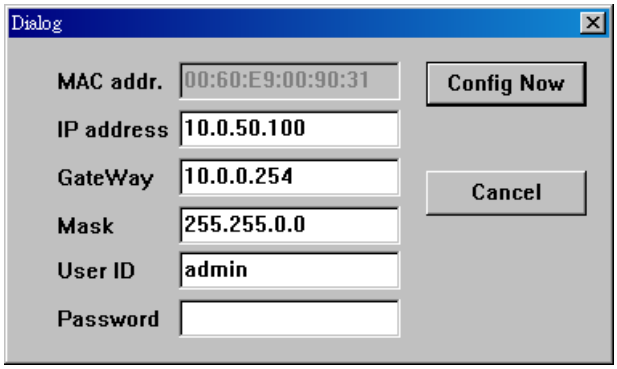
Port number 4660 is default of GW21C-MAXI and is associated with serial port COM1 respectively. After your application program connects to the TCP port 4660 of GW21C-MAXI, data being sent to this TCP connection from your application program are transparent to the COM1 of GW21C-MAXI. Vice versa is also true.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

4. Software Configuration

4.1 Configuration set by monitor.exe utility

Use **monitor.exe** that comes with the product CD or diskette to configure the network parameters of GW21C-MAXI. As you can see from the following picture, you can change IP address, gateway IP address, subnet mask, user ID and password of GW21C-MAXI from the utility. For more details of the utility please refer to Appendix-D Configuration Utility.



4.2 Configuration set by Telnet utility

You can use Telnet utility to change configuration settings of GW21C-MAXI. To do so, please do the following.

Log in to the system

Telnet to GW21C-MAXI using command "**Telnet IP_address**".

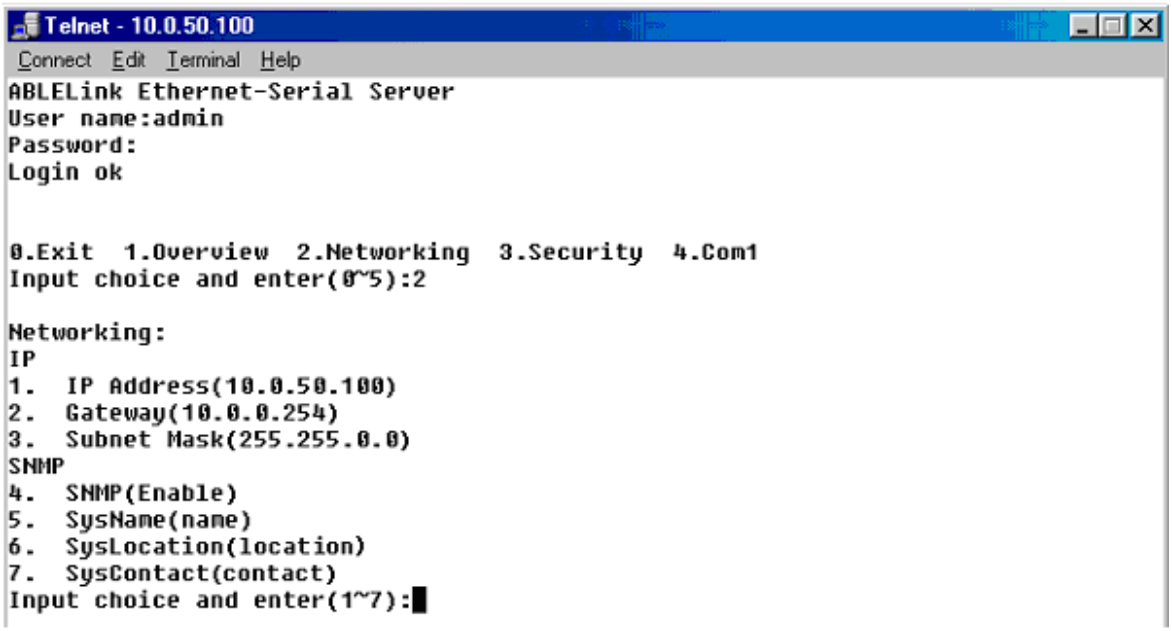
For example Telnet 10.0.50.100

1. After telnet to GW21C-MAXI, system prompts for a password, the default password is null.

Note: You can press the reset button of GW21C-MAXI to reset the password to the default value.

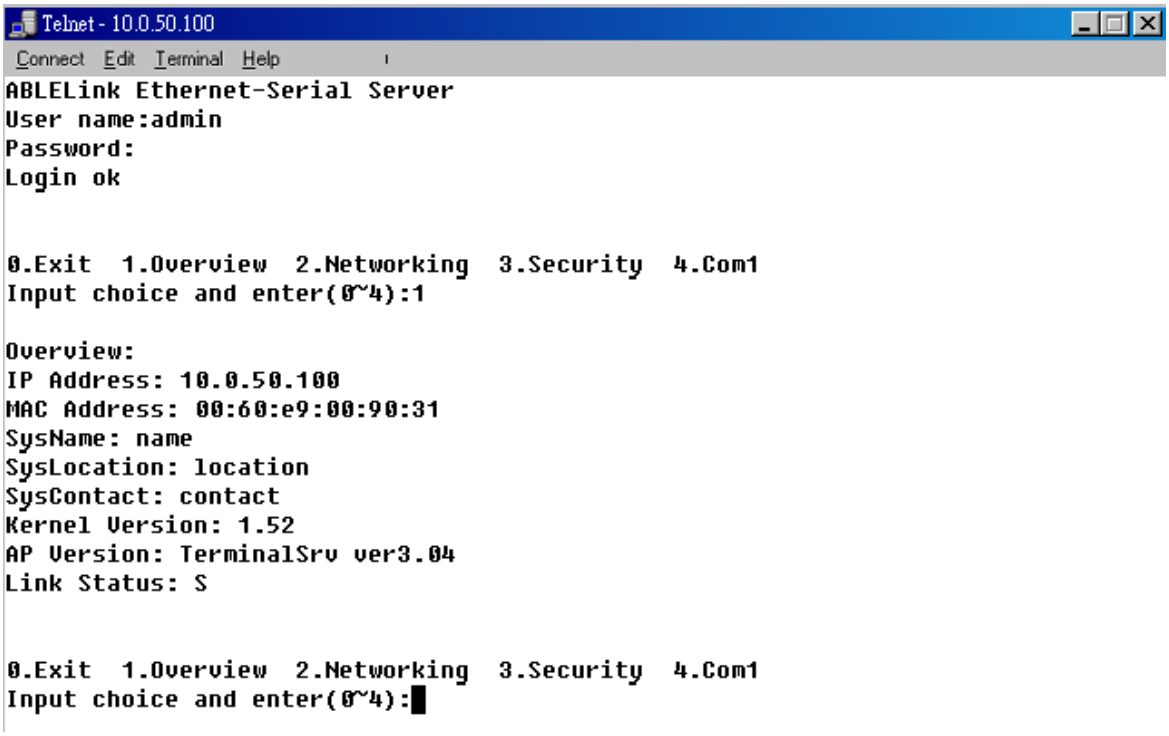
2. After verifying the password, the following terminal screen appears.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



NOTE:

1. If GW21C-MAXI does not receive any command within 1 **minute**, Telnet will be terminated automatically.
2. The changes of networking parameters will take effect only when you exit and restart GW21C-MAXI.
3. Select “1” from “Input choice and enter (0~4):” to enter overview page as following:

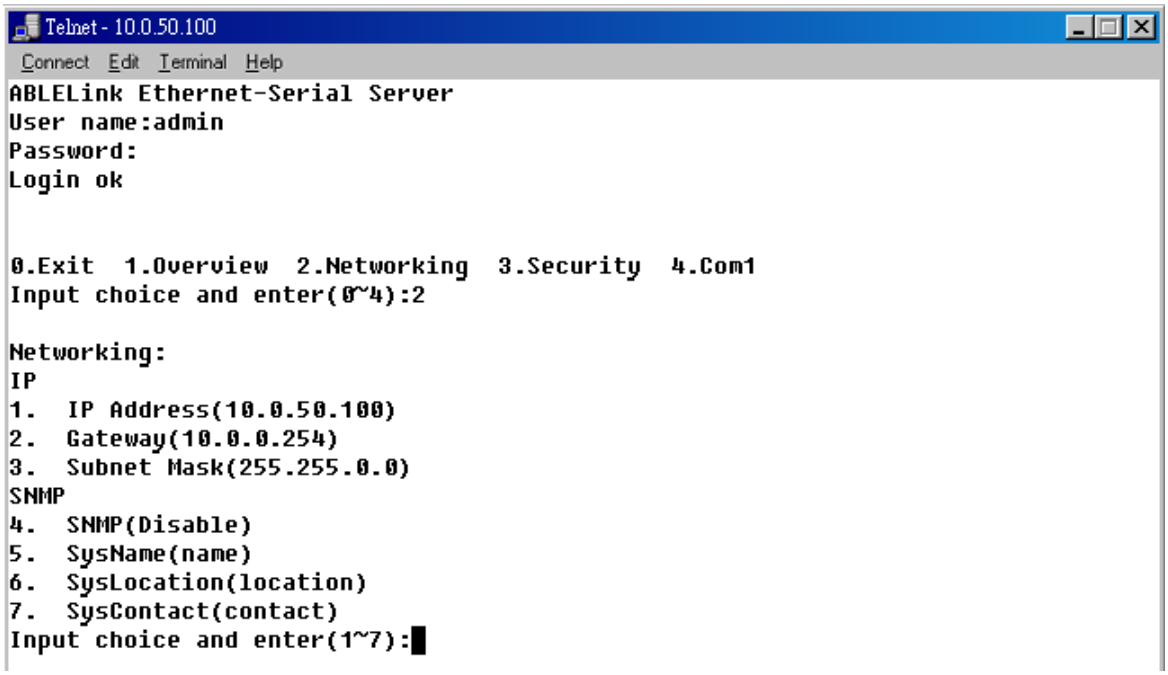


This page gives you the general information of GW2iC-MAXI including IP and MAC address, SNMP information, kernel and AP version, and connection status of the device.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Networking

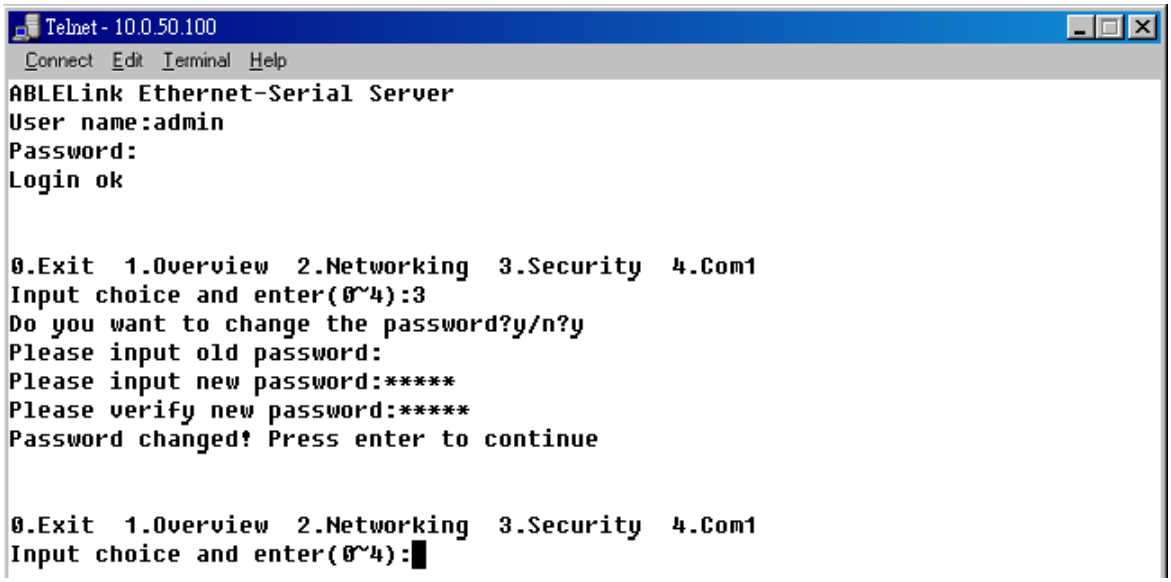
Select “2” from “Input choice and enter (0~4):” to enter Networking page as following:



This page allows you to change network settings of the device including IP address, subnet mask, gateway IP address and SNMP information of GW21C-MAXI. Please notice that any setting change made on this page won’t take effect until you restart the device.

Change the password

1. Select “3” from “Input choice and enter (0~4):” the following screen appears.



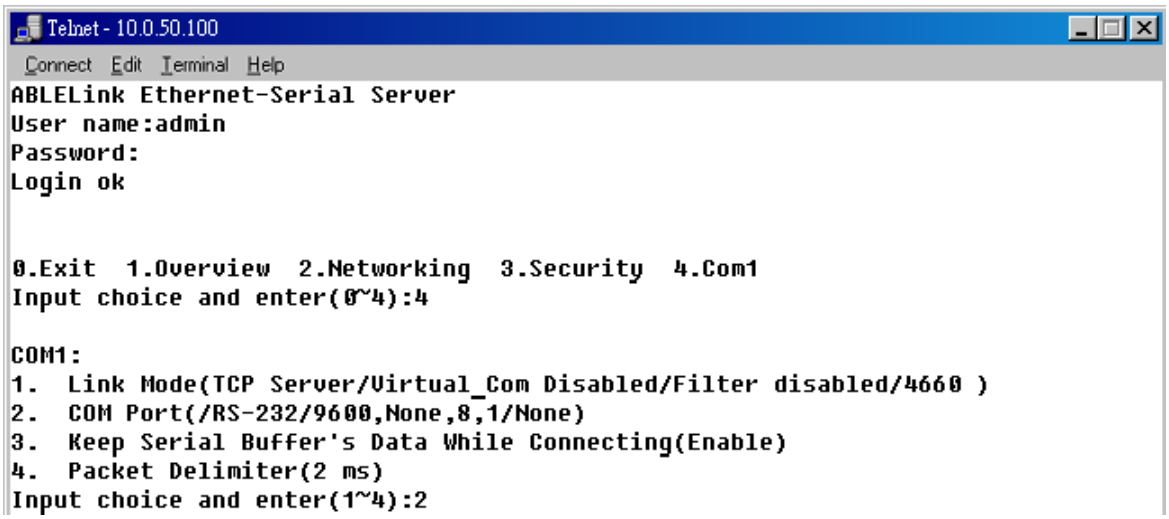
2. If you want to change the password, please type the old password in the “Please input old password” field, type the new password in the “Please input new password” and the “Please verify new password” fields.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Note: You can press the reset key of product to reset password to the default value.

COM1 Setup

Select “4” from “Input choice and enter (0~4):” the following screen appears:



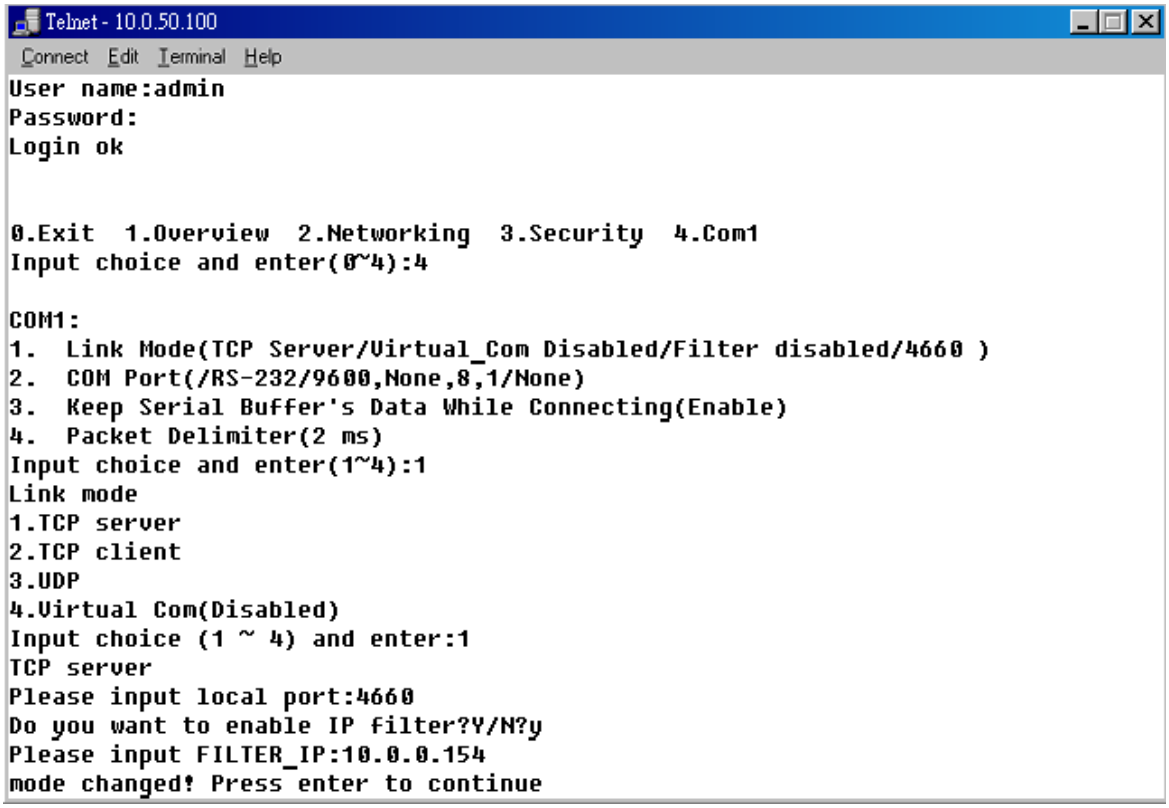
The page gives you the opportunity to configure parameters of COM1 setting which include COM1 working mode, port parameters, enabling or disabling serial buffer’s data and setting packet delimiter.

LINK1 Setup

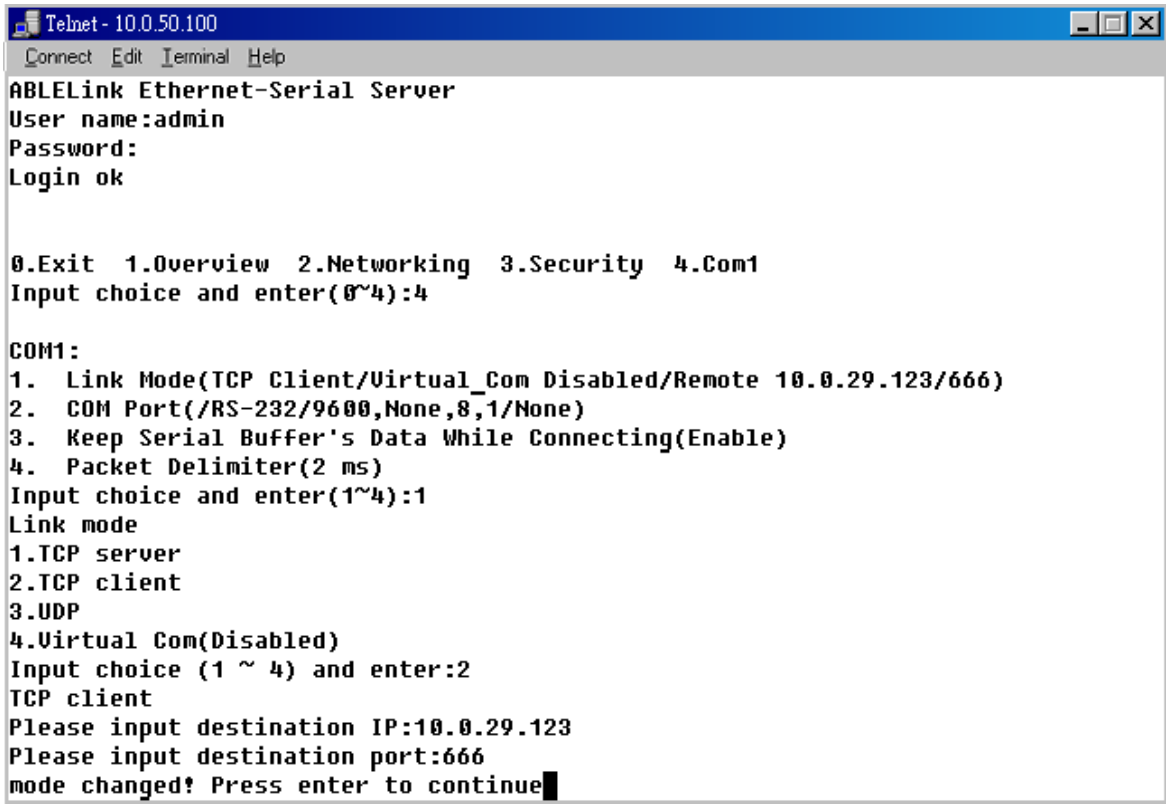
Type 1 from “Input choice and enter (1~4):” of COM1, the following screen appears. Configure GW21C-MAXI as TCP server and the local port is 4660. IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.0.154 can connect to GW21C-MAXI.

Note: IP filtering function is disabled if setting FILTER_IP to “0.0.0.0”.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

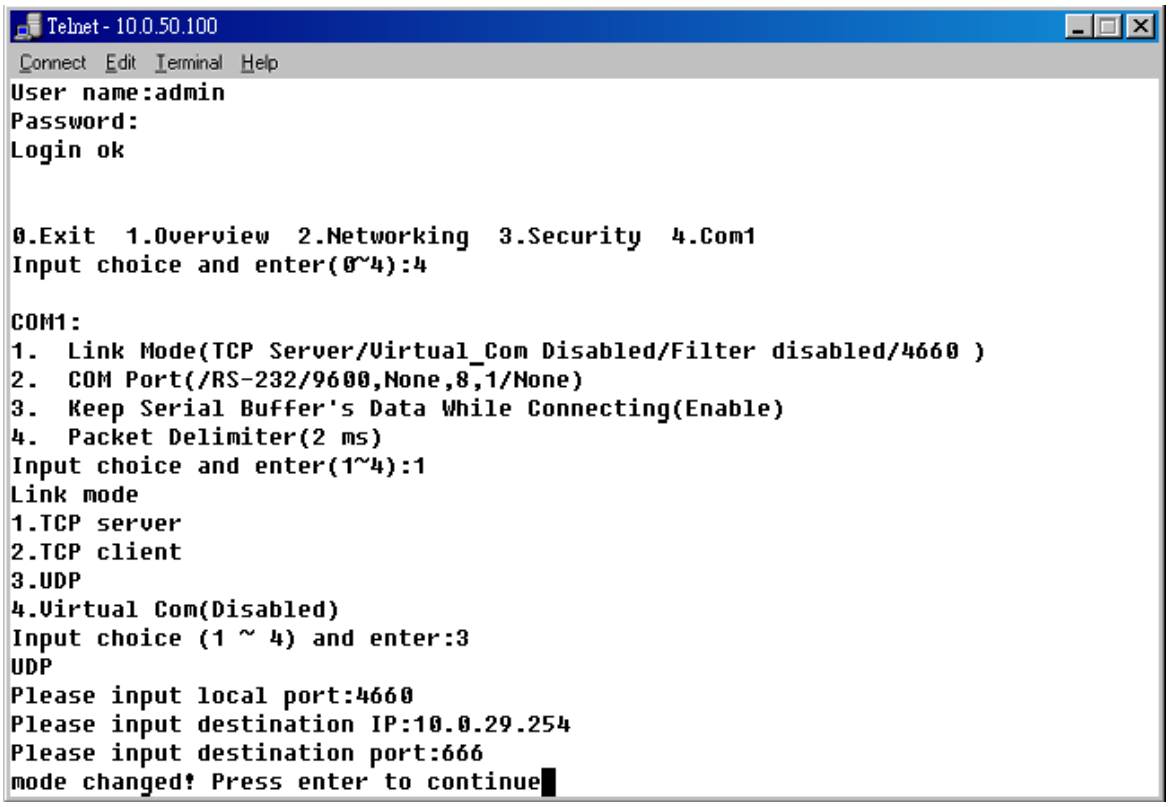


Configure GW21C-MAXI as TCP client, the destination IP is 10.0.29.123, destination port is 666.



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

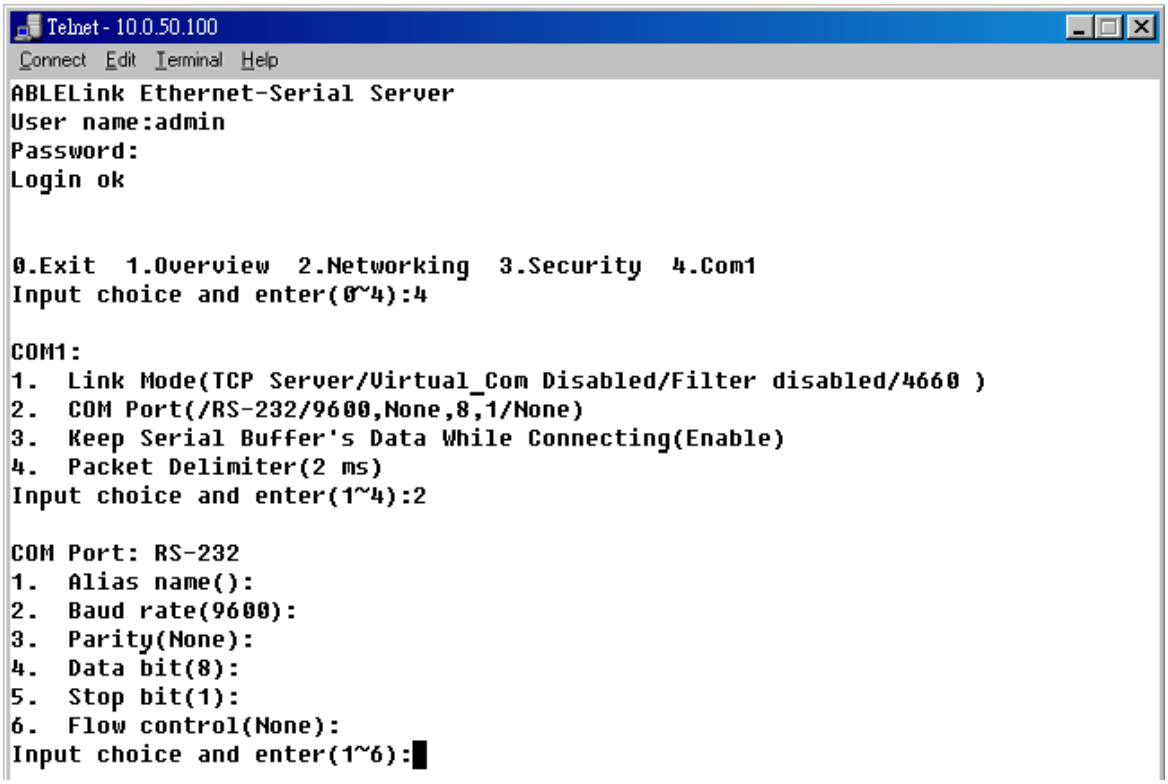
Configure GW21C-MAXI as UDP client, the local port is 4660, the destination IP is 10.0.29.254, destination port is 666.



COM port setting

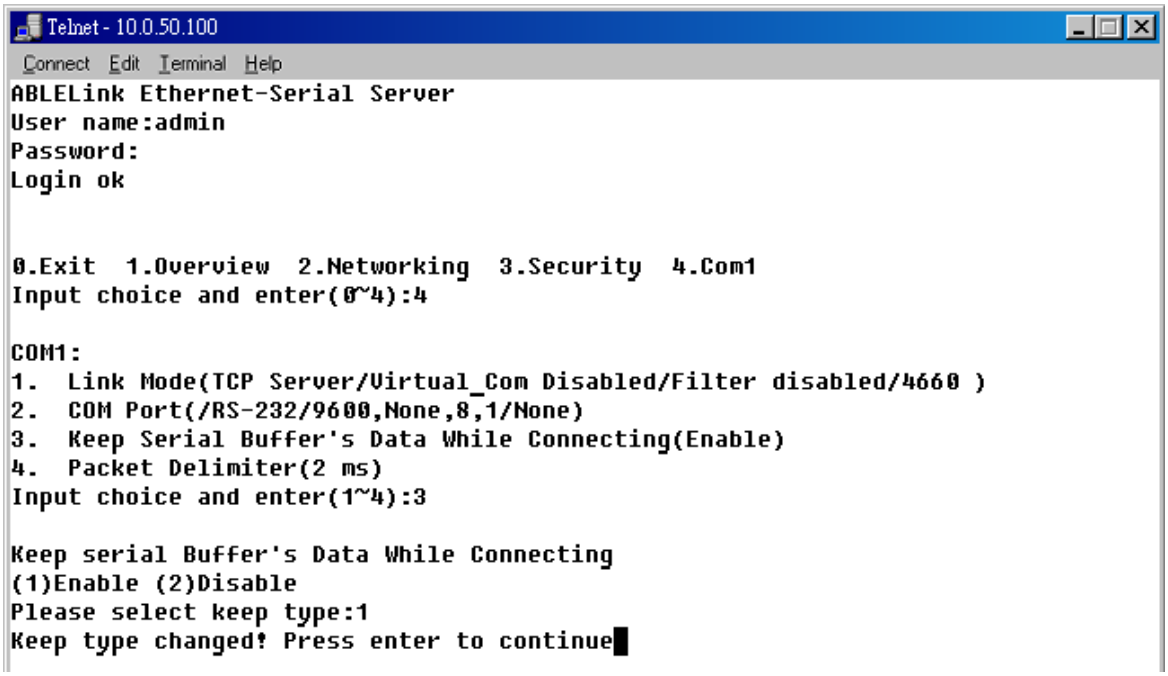
Type 2 from “Input choice and enter (1~4):” of COM1, the following screen appears, you can then give the COM port alias name, set the baud rate and parity, determine number of data bit and stop bit, and decide if you want to use flow control and the type of flow control you want to use.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



Enabling serial data buffer

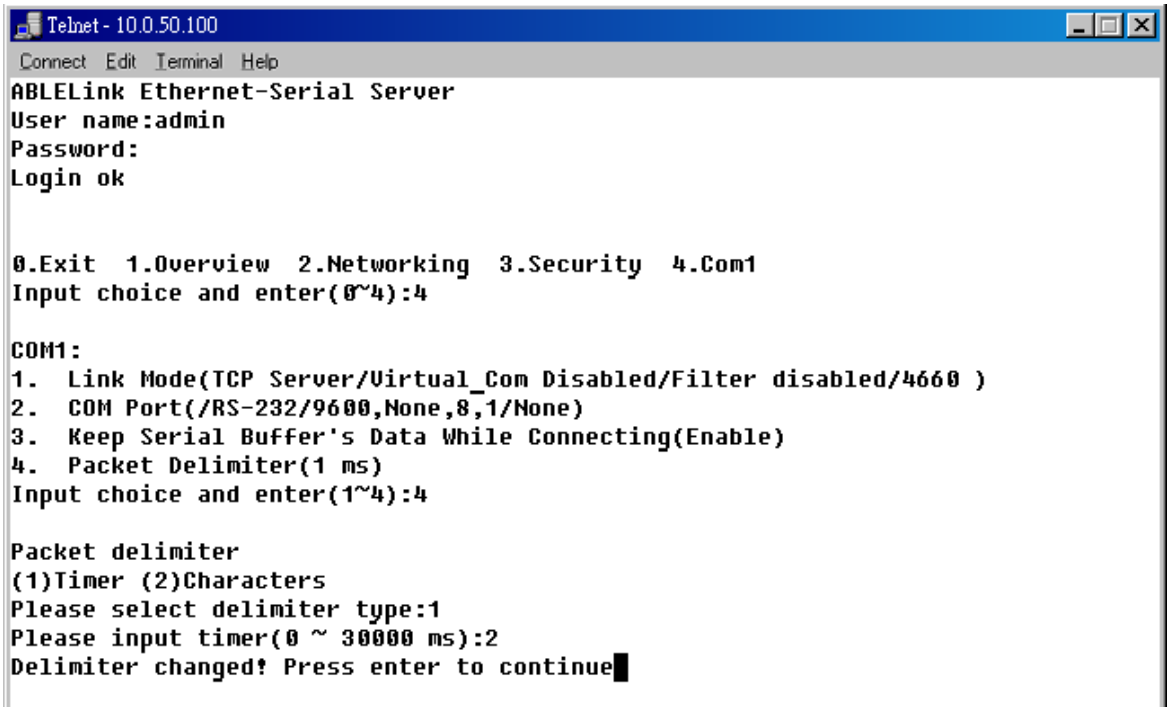
Type 3 from “Input choice and enter (1~4):” of COM1, by default COM port serial data buffer is enabled meaning that when TCP/IP Ethernet connection is broken, serial data collected from serial device will be kept in GW21C-MAXI, once TCP/IP connection is resumed, the serial data will be sent through Ethernet connection, you can disable it if you wish.



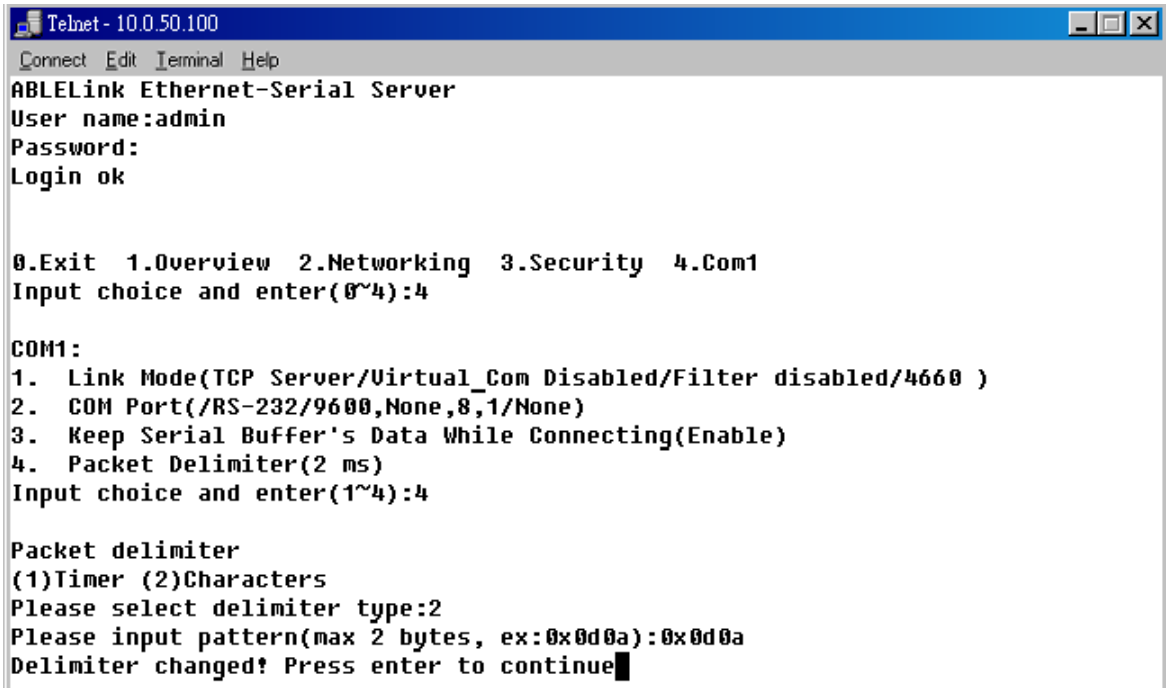
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Setting packet delimiter

Packet delimiter is a way of controlling packets within serial communication. It can prevent packets from being cut thus keep the packets complete. GW21C-MAXI provides two ways of parameter setting as inter character timer and terminator. By default packet delimiter timer is 1 ms, you can change timer shown in the following figure:



You can also choose character pattern as the packet delimiter indicated in the following figure:



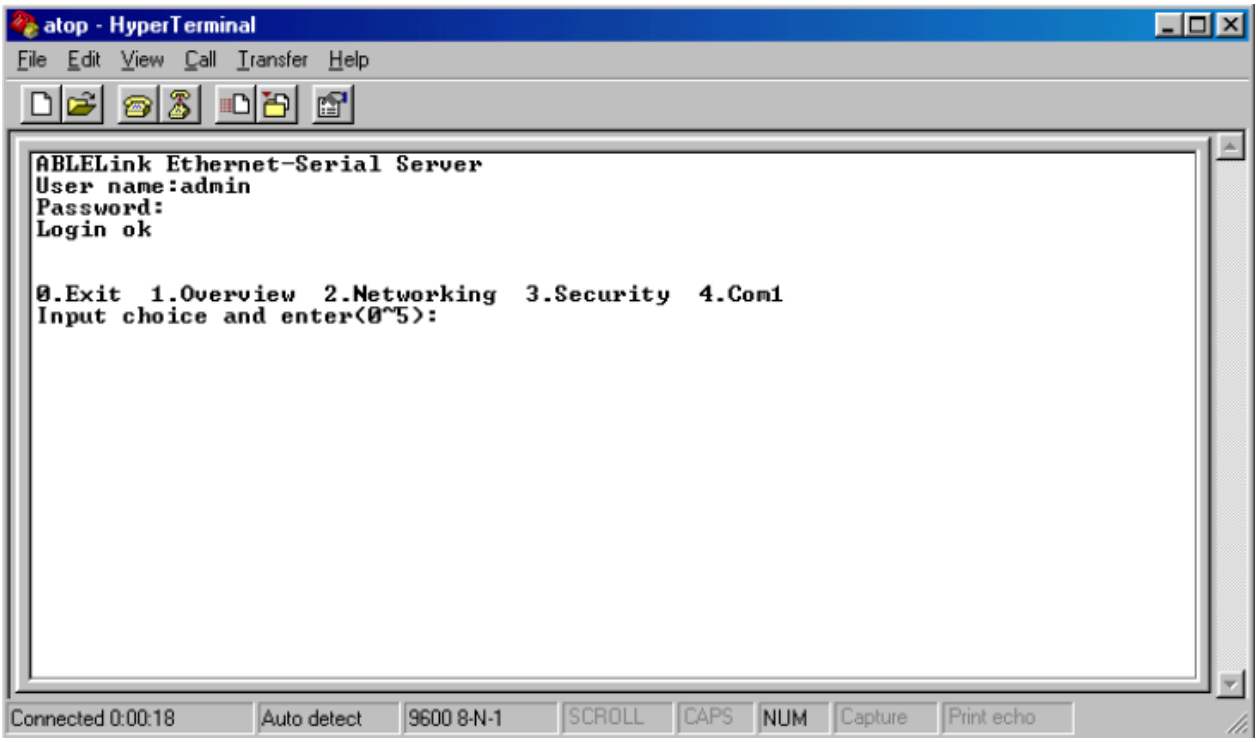
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

4.3 Configuration set by Hyper Terminal console utility

1. Power off GW21C-MAXI.
2. Set the MODE switch SW1 to 'OFF' and SW2 to 'ON'.
3. Use a PC to connect to GW21C-MAXI's console with RS-232 cross over cable.
4. Power on GW21C-MAXI.
5. Open a Hyper Terminal program from your computer Start menu -> Programs -> Accessories -> Communication -> Hyper Terminal, set COM2 parameters as follows.
   - Baud rate: 9600 bps
   - Data bit: 8 bits
   - Parity: None
   - Stop bit: 1bit
   - Flow control: None

   Note:

   At present time baud rate is fixed at **9600 bps** for console port communication, RS-232C parameters of your computer COM port and GW21C-MAXI must be the same.
6. Once Hyper Terminal is connected, type in username and password then the following Hyper Terminal window appears,



7. The following configuration operations are totally the same as those by Telnet.
8. After finishing console settings, power off GW21C-MAXI, put SW1 and SW2 back to the previous setting.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

4.4 Configuration set by web browser

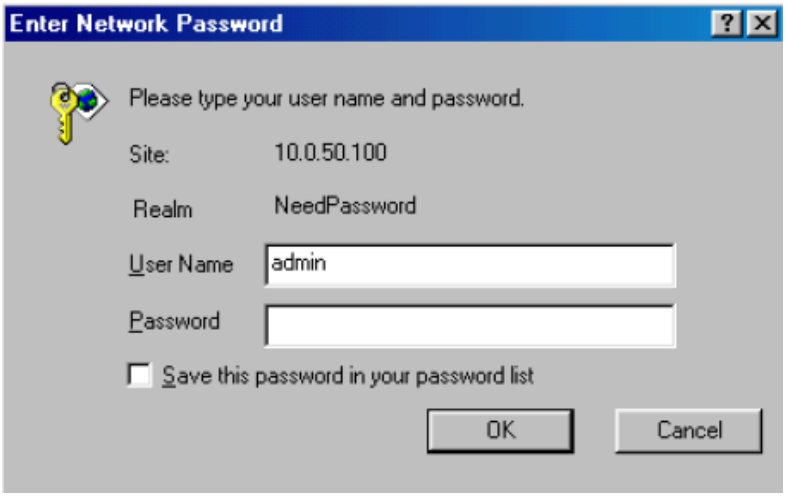
It is also possible to modify various settings through the web server interface. To do so, please follow the steps below.

Log in to the system

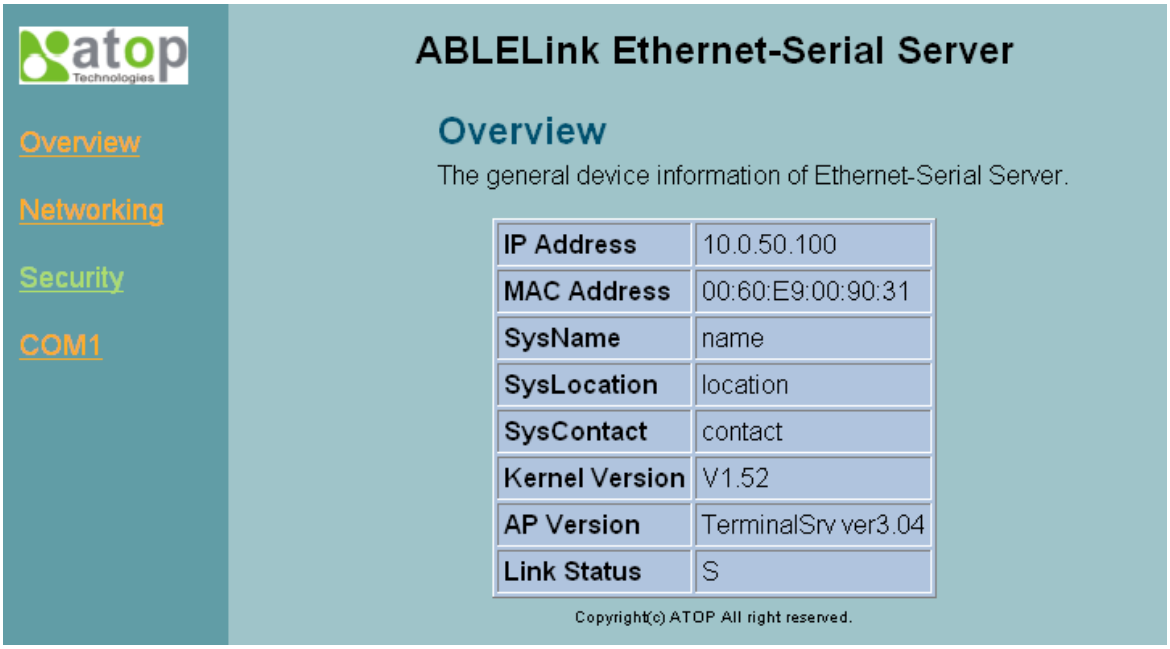
1. From web browser, type in the IP address of GW21C-MAXI in the URL.

   Example: http://10.0.50.100

2. The following authentication screen appears. Please type in user name and password then click on OK. The user name is admin and password is null by default.



3. The following overview page appears.



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Change the password

1. Click on the “Security” link and the following screen appears.

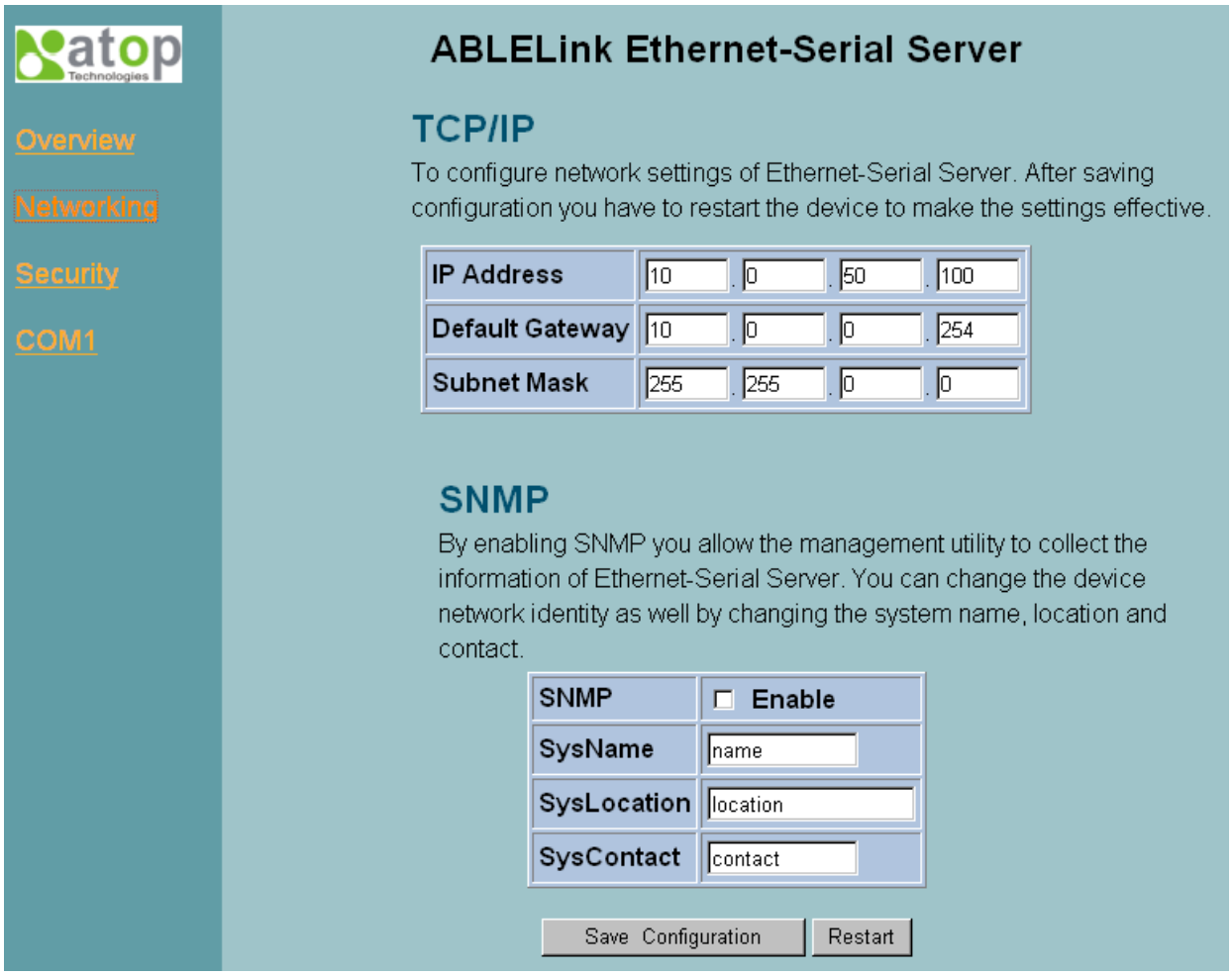
2. Please input the old password in the “Old Password” field, input the new password in the “New Password” and the “Verified Password” fields, and then click on “Save Configuration” to update the password.

   Note: You can press the reset key of product to reset password to the default value.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Network setup

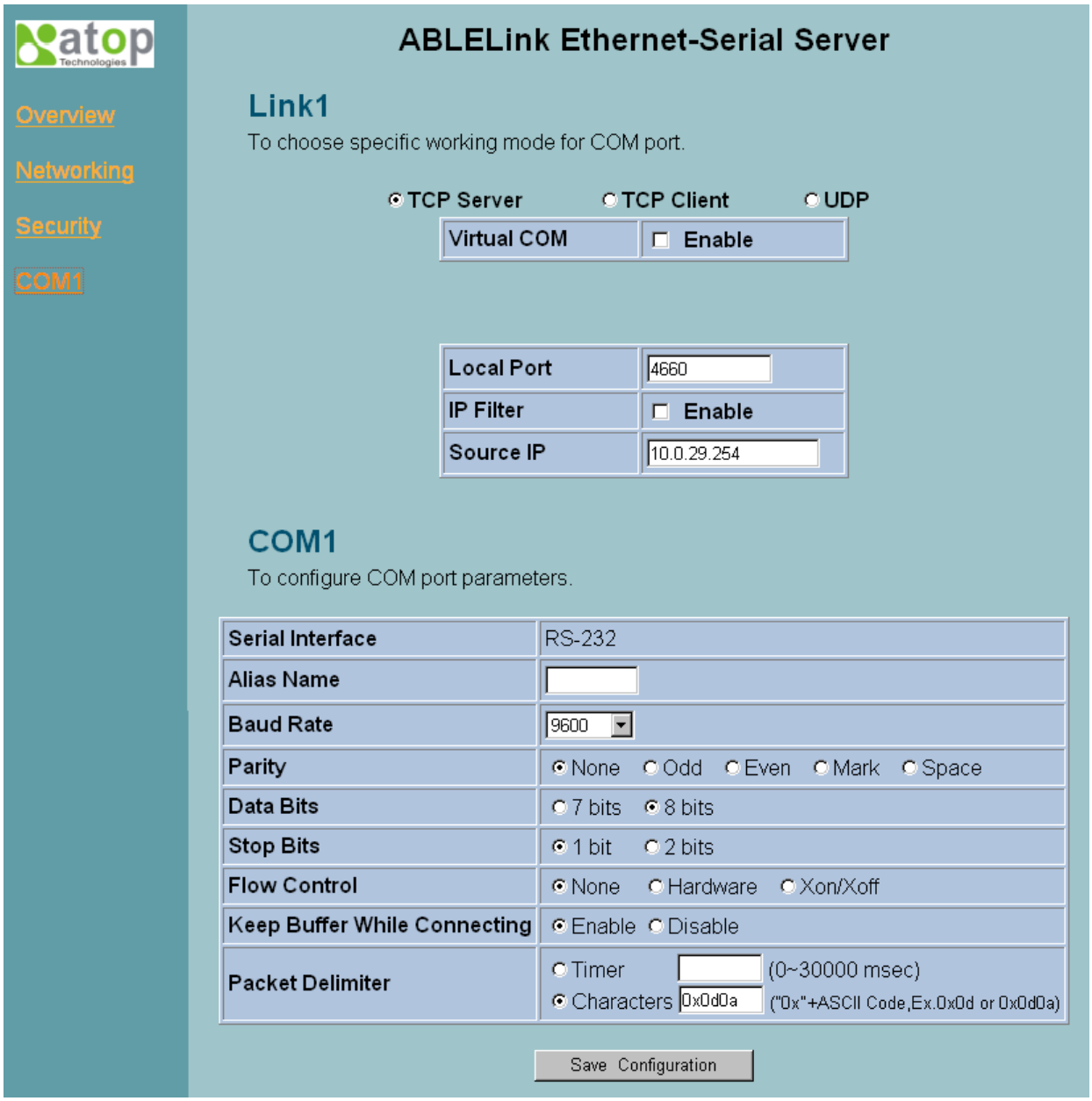
Click on the *"*Networking*"* link and the following screen appears. Fill in IP information under TCP/IP field. Enable SNMP by checking "Enable", fill in network identification information under SNMP field and click on the "Save Configuration" button to save the changes, please notice that the setting will not become effective until you restart GW21C-MAXI.



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

COM1 Setup

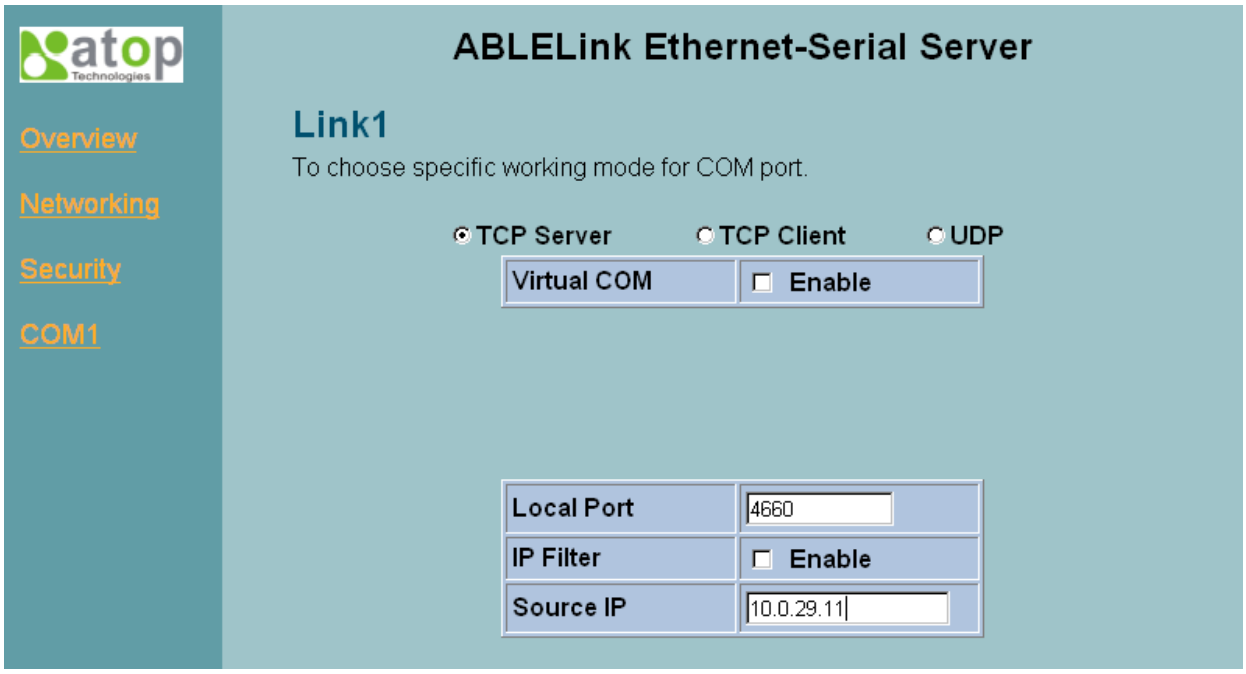
Click on the ***"COM1"*** link and the following screen appears. Fill in COM1 parameter information under COM1 field then click on "Save Configuration" button to save the changes.



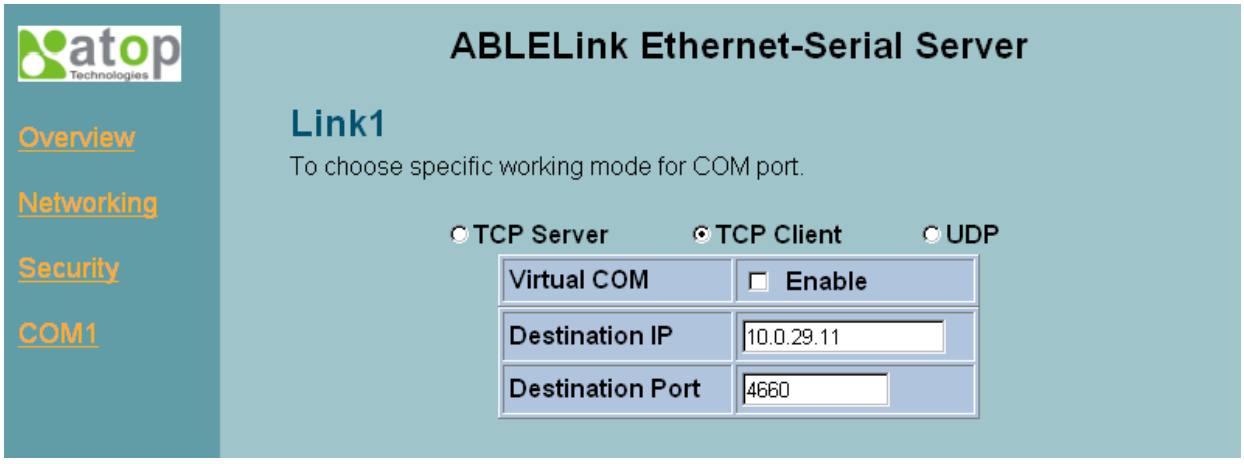
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

LINK1 Setup

1. Click on the ***"COM1"*** link and the following screen appears, you can configure GW21C-MAXI as transparent mode by default. Configure GW21C-MAXI as TCP server and the local port is 4660, IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.29.11 can connect to GW21C-MAXI.

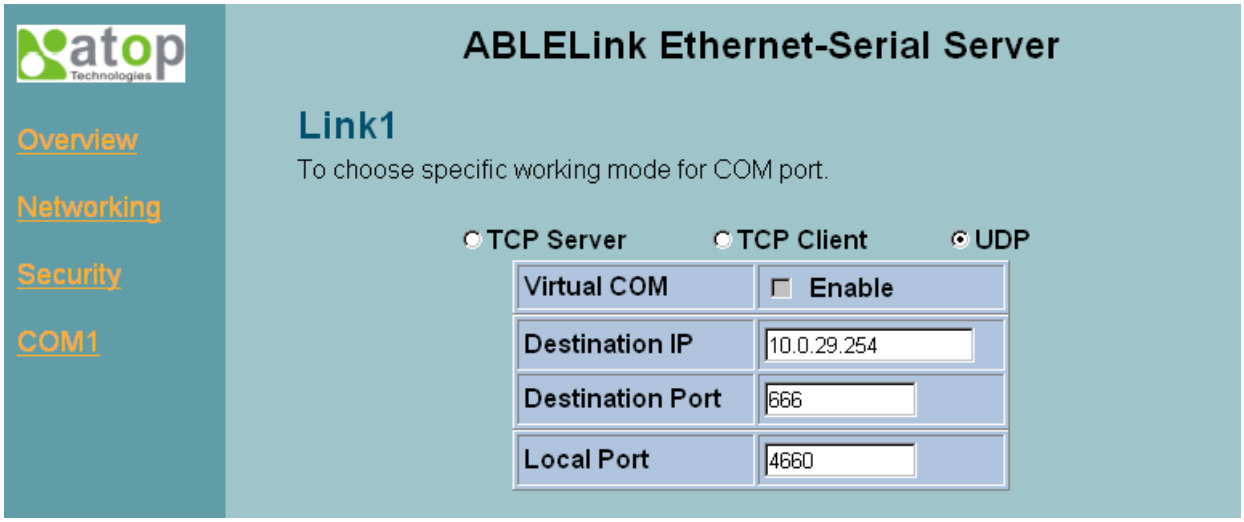


Configure GW21C-MAXI as TCP client, the destination IP is 10.0.29.11, destination port is 4660.



Configure GW21C-MAXI as UDP mode. Local port is 666, destination IP is 10.0.50.100 and destination port is 4660.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

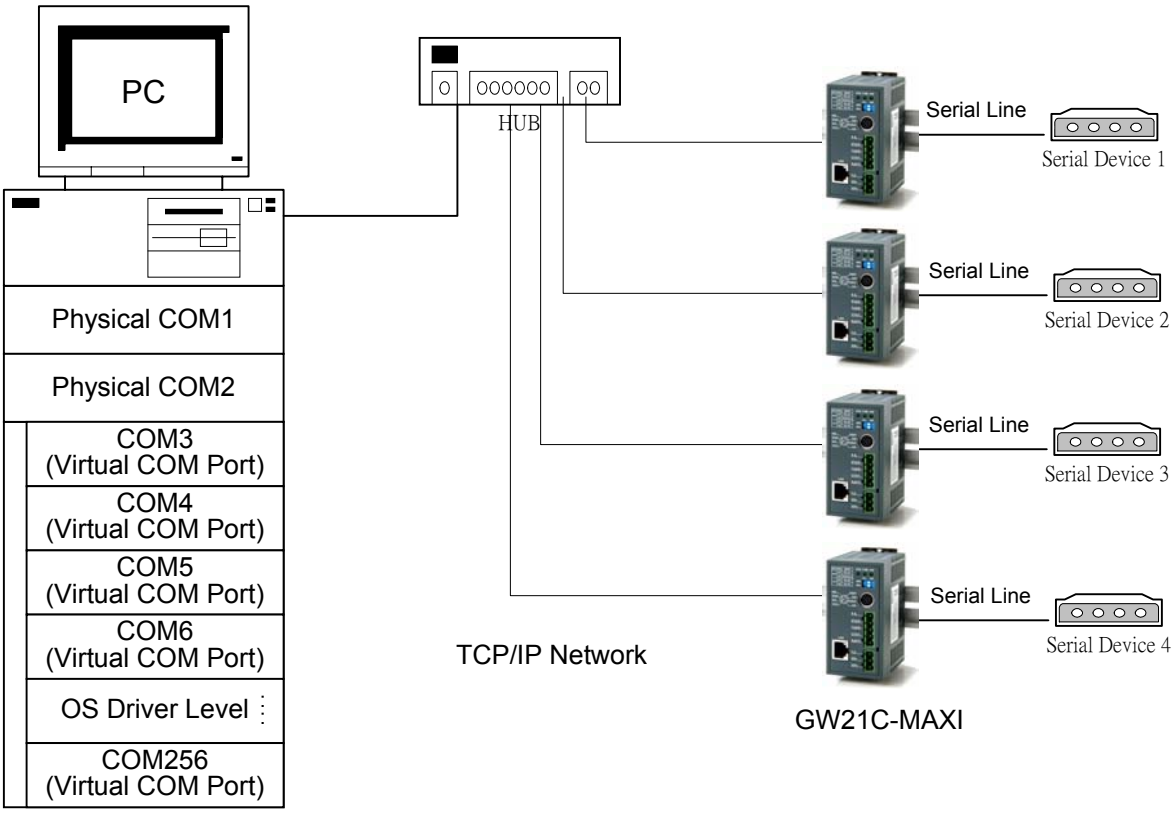


2. Click on “Save Configuration” to save the changes.
3. If the update is successful, the following screen appears.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

4.5 Virtual COM Mode

Virtual COM driver mode for windows converts COM data to LAN data to control the RS-232C port on a GW21C-MAXI via the LAN. By creating virtual COM ports on the PC, Atop Virtual COM redirects the communications from the virtual COM ports to an IP address and port number on a GW21C-MAXI that connects the serial line device to the network. The following figure is Atop Virtual COM connection diagram.



4.5.1 Setup of a virtual COM driver

Correspondence OS

Atop Virtual COM driver can be used on Windows XP, Windows 2000, Windows NT 4.0 SP5 or later, Windows Me or Windows 98, Microsoft NT/2000 Terminal Server.

Cautions on Use

Atop Virtual COM supports firmware AP v3.4 and above of ABLELink Serial-Ethernet Servers.

Limitation

Atop Virtual COM driver provides user to select **two COM ports** as Virtual COM ports in a monitoring PC. User can select them from a list of COM ports, which is from COM1 up to COM256.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Installation

Make sure you have turned off all anti-virus software before beginning the installation. Run AtopVcom.exe program included in the CD to install Atop Virtual COM for your operating system.

In the end of the installation, please select one or two COM ports to become the Virtual COM ports.

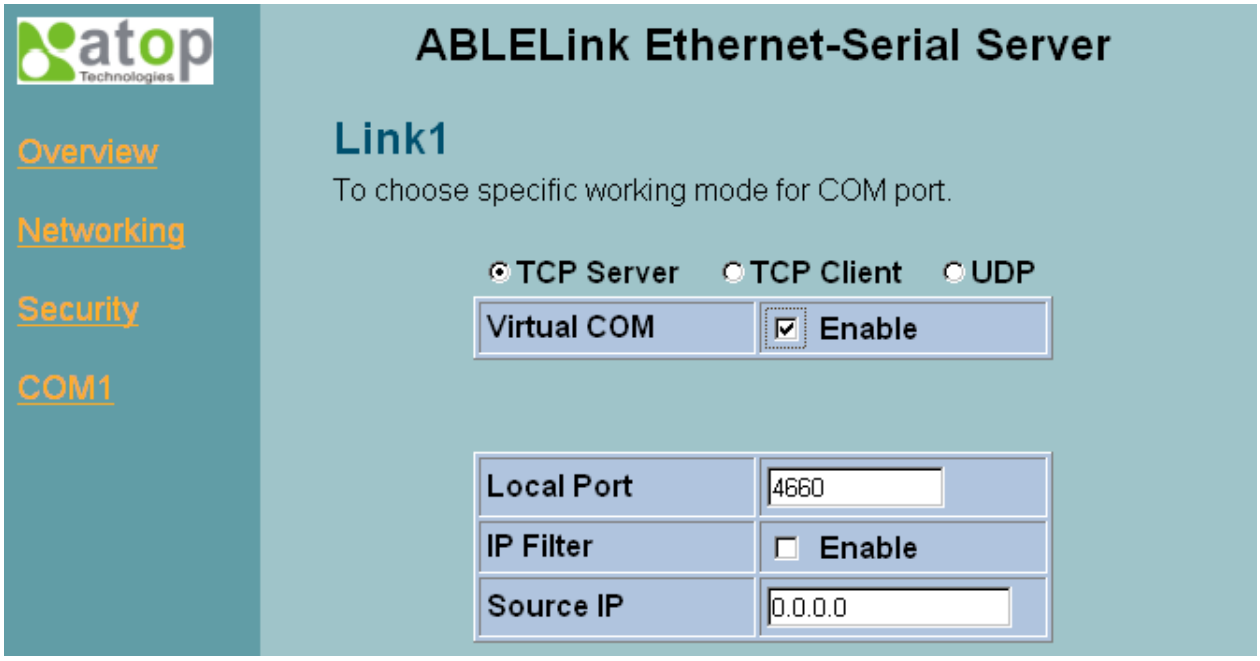
Uninstalling

1. From Windows Start menu select Setting, Control Panel, Add/Remove Programs.
2. Select **Serial IP for ATOP** in the list of installed software.
3. Click the **Add/Remove** button to remove the program, or From Windows Start menu select Programs, Serial IP for ATOP, **Uninstall Serial IP for ATOP** to remove the program.

4.5.2 Virtual COM communication

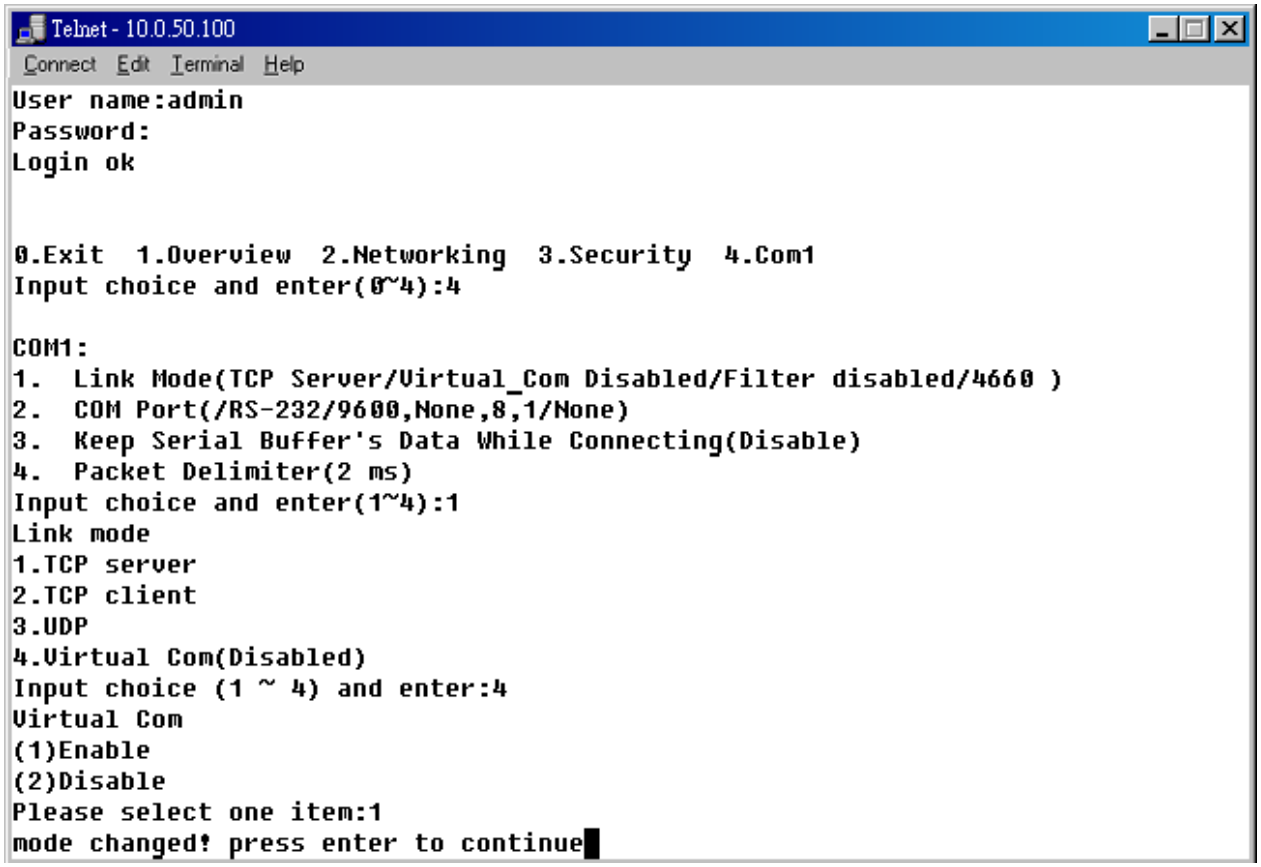
4.5.2.1 Enable virtual COM on GW21C-MAXI

From web browser access to GW21C-MAXI by typing its IP address, click on COM1 link to access COM1 page, on the top half of the page click on “TCP Server” and enable virtual COM by putting a check in front of the “Enable” button, then type in the local port number in the “Local Port” field as indicated in the following figure:



Or you can enable Virtual COM through telnet by setting COM1 as TCP server, and type in the local port number for COM1, then enable Virtual COM as shown in the following figure:

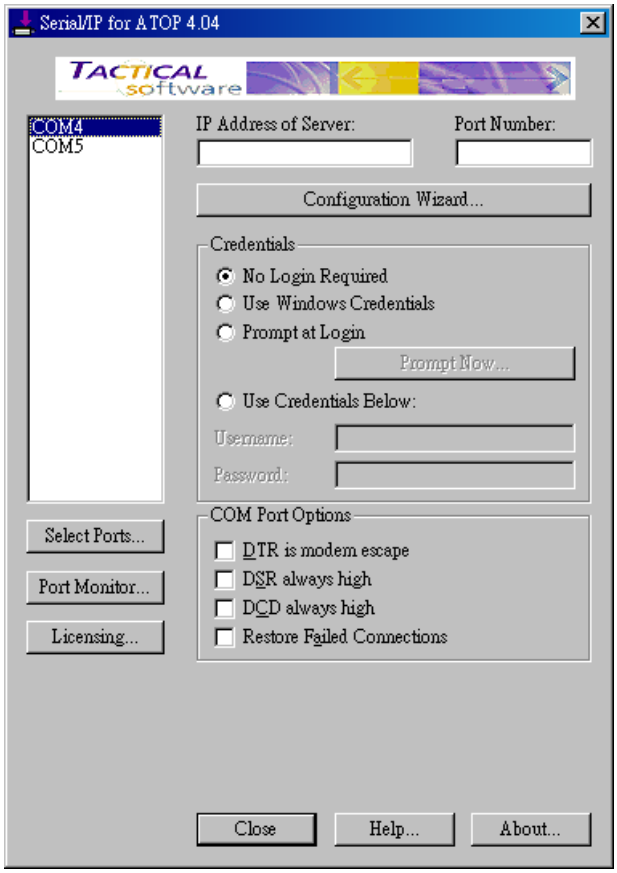
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

4.5.2.2 Run Serial/IP for ATOP program on monitoring PC

In the Window Start Menu, select the Serial/IP for ATOP program group and select **Serial/IP for ATOP Configuration**. The configuration window is shown as following:



At right is a sample Virtual COM Control Panel window. At the left is the list of the COM ports that you have selected (in the Select Ports window) for use by the Virtual COM Redirector. If you wish to change which ports appear in this list, use the **Select Ports** button.

Each COM port has its own settings. When you click on a COM port, the Control Panel display changes to reflect the settings for that COM port.

Note: When you change settings for a COM port, the changes are effective immediately. There is no separate confirmation dialog to confirm or cancel your changes.

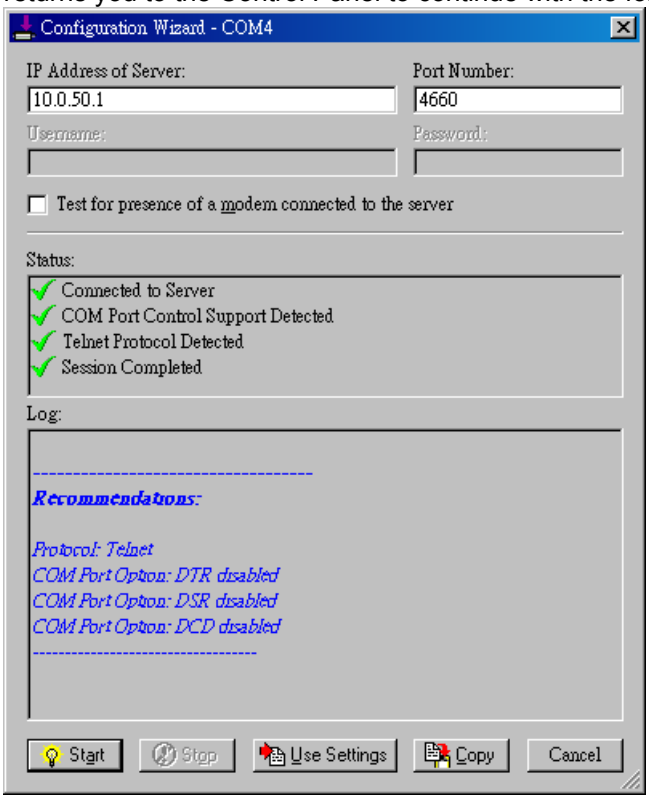
Configuring Virtual COM Ports

You configure each Serial/IP COM port as follows:

1. Select a COM port in the list.
2. For **IP Address of Server**, enter a numeric IP address for the serial server.
3. For **Port Number**, enter the TCP port number that the serial server uses to provide its serial ports to the network.
4. For **Server Credentials**, the default is **No Login Required**. If your serial server does require a login by the Virtual COM Redirector, the Virtual COM Redirector needs to provide a username and/or password every time an application tries to use the serial server.
5. Click the **Configuration Wizard** button and then click the **Start** button that appears in the wizard

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

window. This important step verifies that the Virtual COM Redirector can communicate with the serial server using the settings you have provided. If the **Log** display does not show errors, click the **Use Settings** button in the wizard, which makes the recommended settings effective and returns you to the Control Panel to continue with the following steps.



6. For Connection Protocol, the setting must match the TCP/IP protocol that the serial server supports. The Configuration Wizard is usually able to determine the correct setting.
7. For COM Port Options, the settings must match the COM port behavior expected by the PC application that will use this COM port. The Configuration Wizard will recommend a combination of settings.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

5. SNMP Setup

5.1 SNMP Network Management Platform

Atop GW21C-MAXI is an SNMP device that allows many popular SNMP Network management platforms such as HP OpenView and SunNet Manager to conduct monitoring on the device.

Depending on the network management tools you are using, device (GW21C-MAXI) information can be collected from running the management tools including IP address, DNS name, system descriptions and NIC information etc.

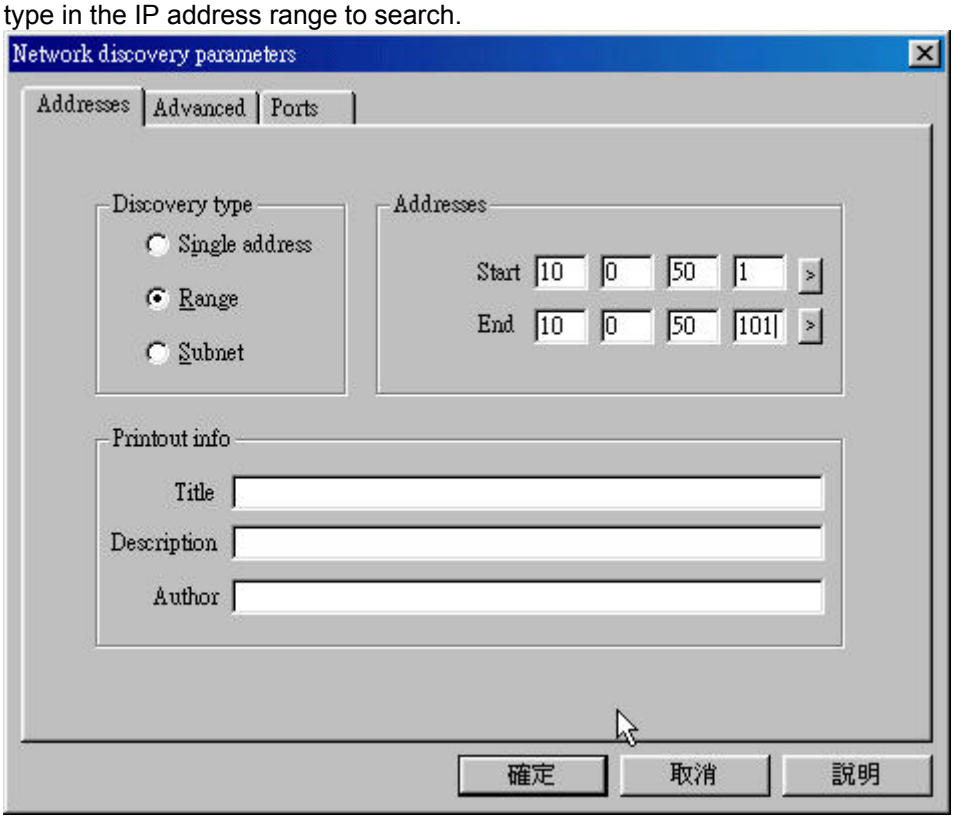
5.2 Using NetworkView As An Example

The NetworkView is a compact network management tool from NetworkView Software, Inc. (www.networkview.com). It discovers all TCP/IP nodes in a network using DNS, SNMP and ports information and documents with printed maps and reports for future use. You may visit their web sites and get a free download.

To use NetworkView, you will need to download and install the tool on your PC (**Windows NT and Windows 9x only**). Please refer to the installation instructions that come with the tool.

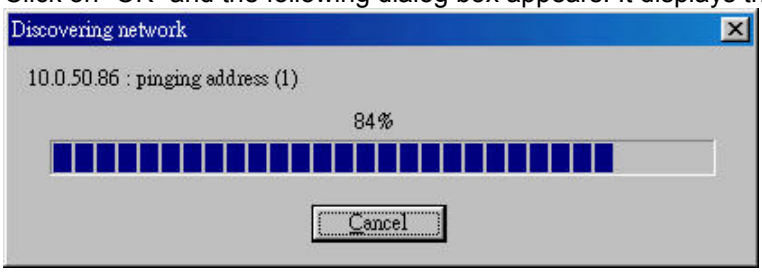
1. After you have done the NetworkView installation, start NetworkView.

2. Click on the button to open a new file. The following screen appears, in the Addresses field, type in the IP address range to search.

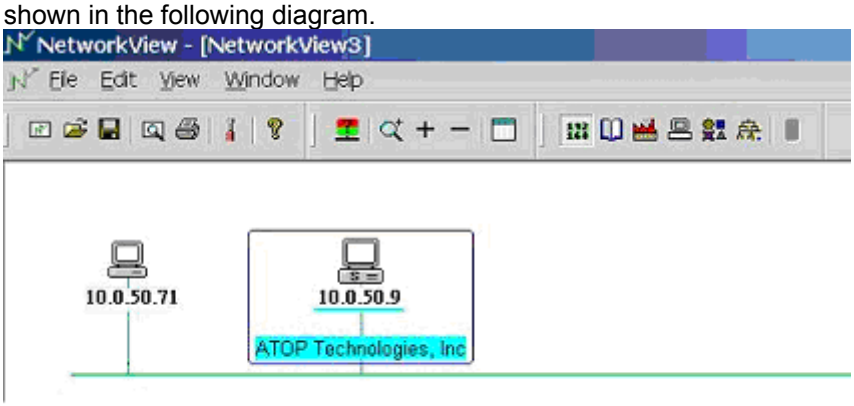


Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

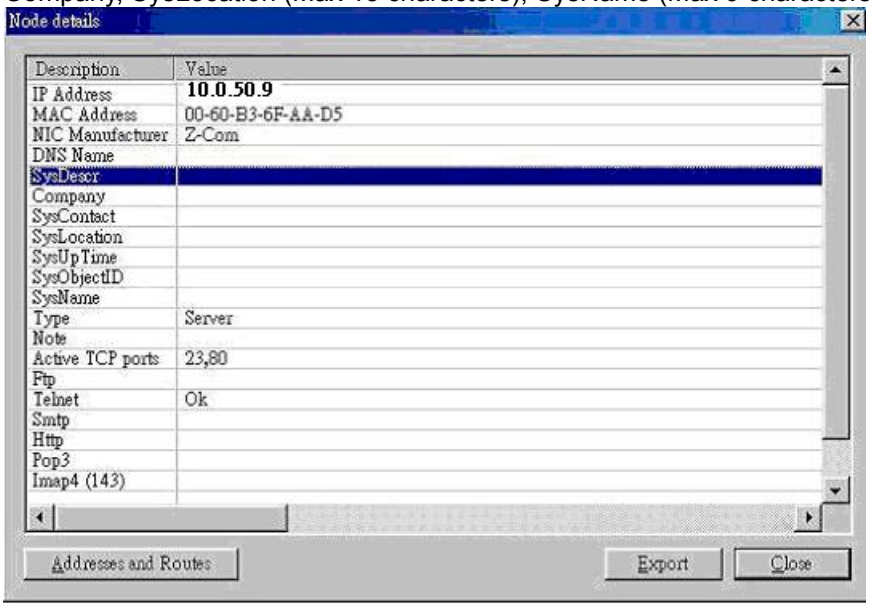
3. Click on “OK” and the following dialog box appears. It displays the searching progress.



4. When the search is completed, NetworkView will display the devices found in the main window, as shown in the following diagram.



5. Double-click on the device icon to display information about the device, including IP Address, Company, SysLocation (Max 15 characters), SysName (Max 9 characters) and types etc.



Note:

1. The NetworkView tool is limited to information extracting and viewing only.
2. To modify the configurations please use the web server, Telnet or monitor.exe configuration utilities.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

6. Start Writing Your Own Applications

Before you start writing your host applications or programs to interact with GW21C-MAXI, please make sure you have done the following.

6.1 Preparing The System

1. Properly connect GW21C-MAXI hardware including power, Ethernet and RS-232/RS-485 cables.
2. Properly configure the parameters of GW21C-MAXI including connection type, IP address, gateway IP address, and network mask accordingly (see chapter 3 **Hardware Installation** section).
3. Configure GW21C-MAXI as TCP Server using default TCP port number 4660.
4. The host (PC) application program must be configured as a TCP client and connects to GW21C-MAXI with designated TCP port number 4660 for COM1.
5. Make sure GW21C-MAXI is running by checking the running status through **monitor.exe** configuration utility.

6.2 Running The Sample Program

Sample programs written in VB and VC++ included in package are provided for your reference, source codes are also included. Test program can be found in the product CD or diskette under the directory of ***sample*****vb_ap**\ and ***sample*****vc_ap*** respectively.

There are two test programs, TCPTEST written in Visual Basic and TCPTEST2 written in Visual C++.

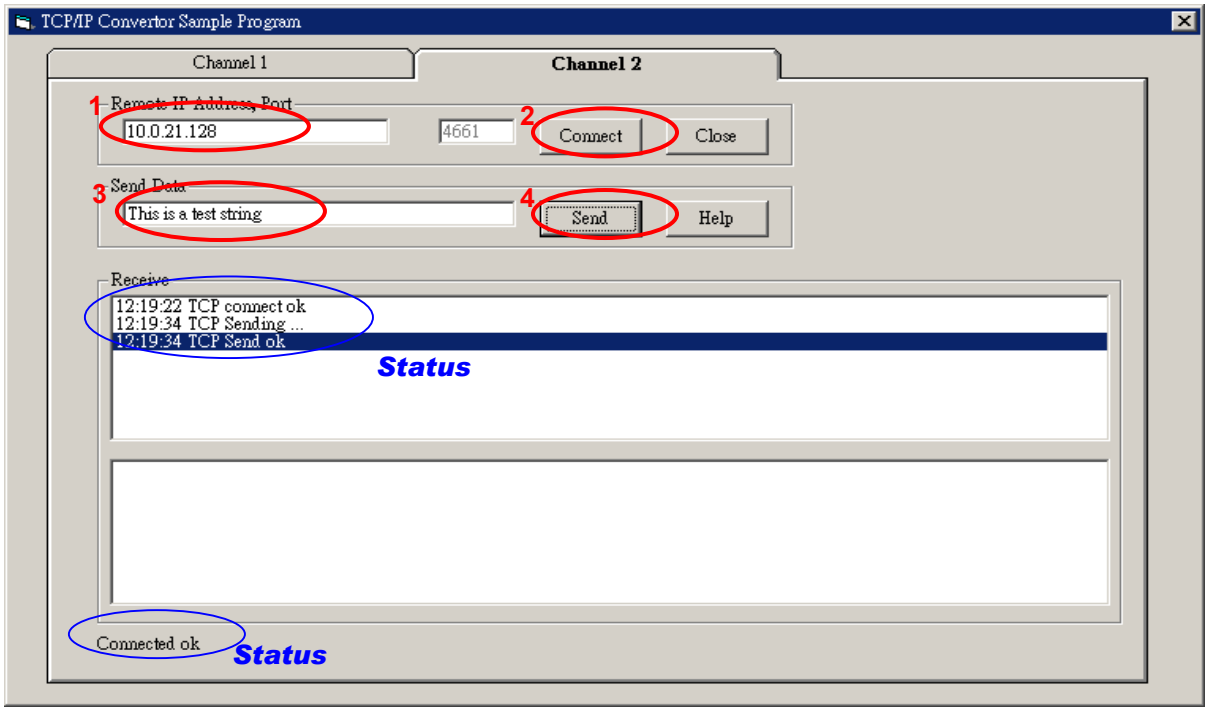
TCPTEST in Visual Basic

This sample program is written in Visual Basic 5.0 with Winsock Controls. It shows you how to send and receive data between host (PC) and GW21C-MAXI via Ethernet in two socket ports.

Run Visual Basic and open sample program tcptest.vbp, after the program is started successfully, you can start testing functions. For more information, please press **Help** in the program to get detail explanation.

Note: Please be sure the Microsoft visual studio family software is installed on the computer. Otherwise the sample program will not run.

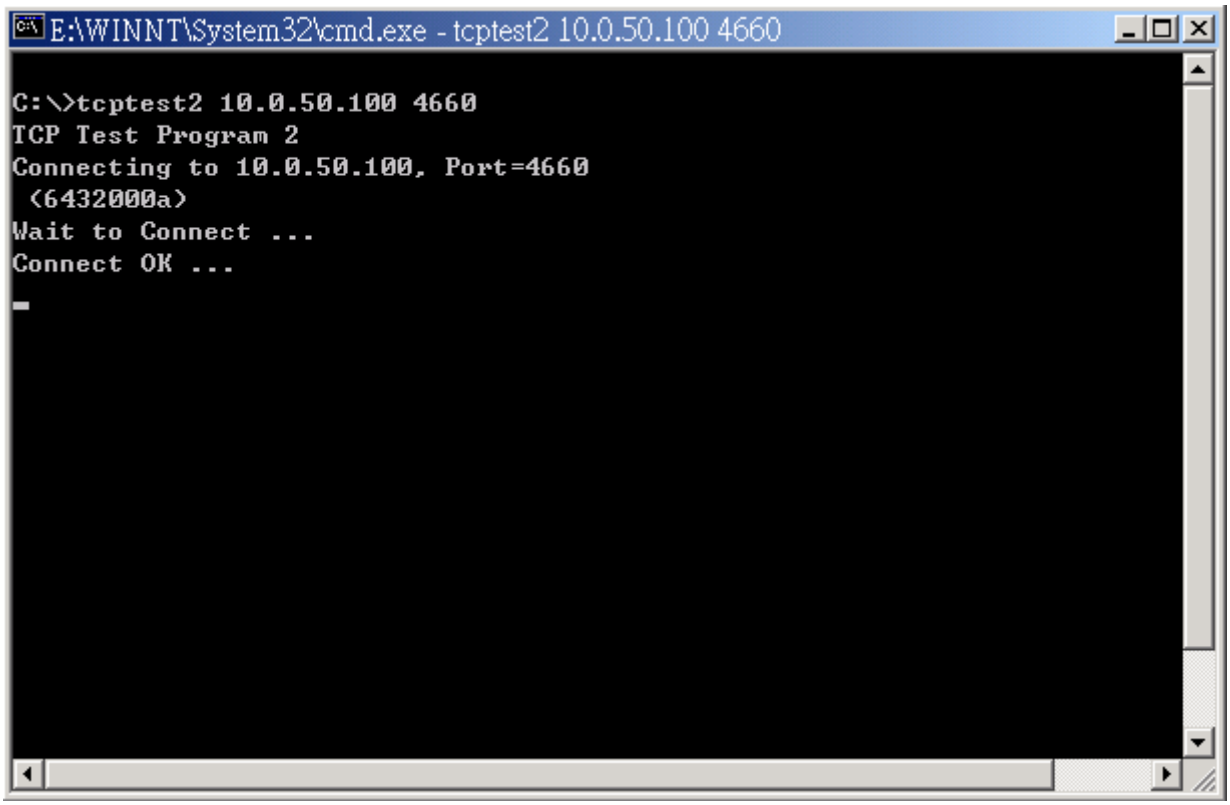
Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



TCPTEST2 in Visual C

To start the program, please type in the following command in the command line prompt:

TCPTEST2 IP_Address Port_Number



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

The command ***tcptest2 10.0.50.100 4660*** brings you to connect to a TCP server of IP address *10.0.50.100* and port number *4660*, the received data is displayed on the screen and the data typed in is sent to the TCP server of the designated port number. You can also send binary data in hex format with a leading character "\". For example, "\00" and "\FF" represent ASCII code 0 and 255 respectively.

You can also use modem to connect to the serial server. Command "***AT\Od***" sends standard AT command to the modem which in return responds with "***OK\0D\0A***" message to the host application.

Always use **'='** then Enter key to exit the program.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

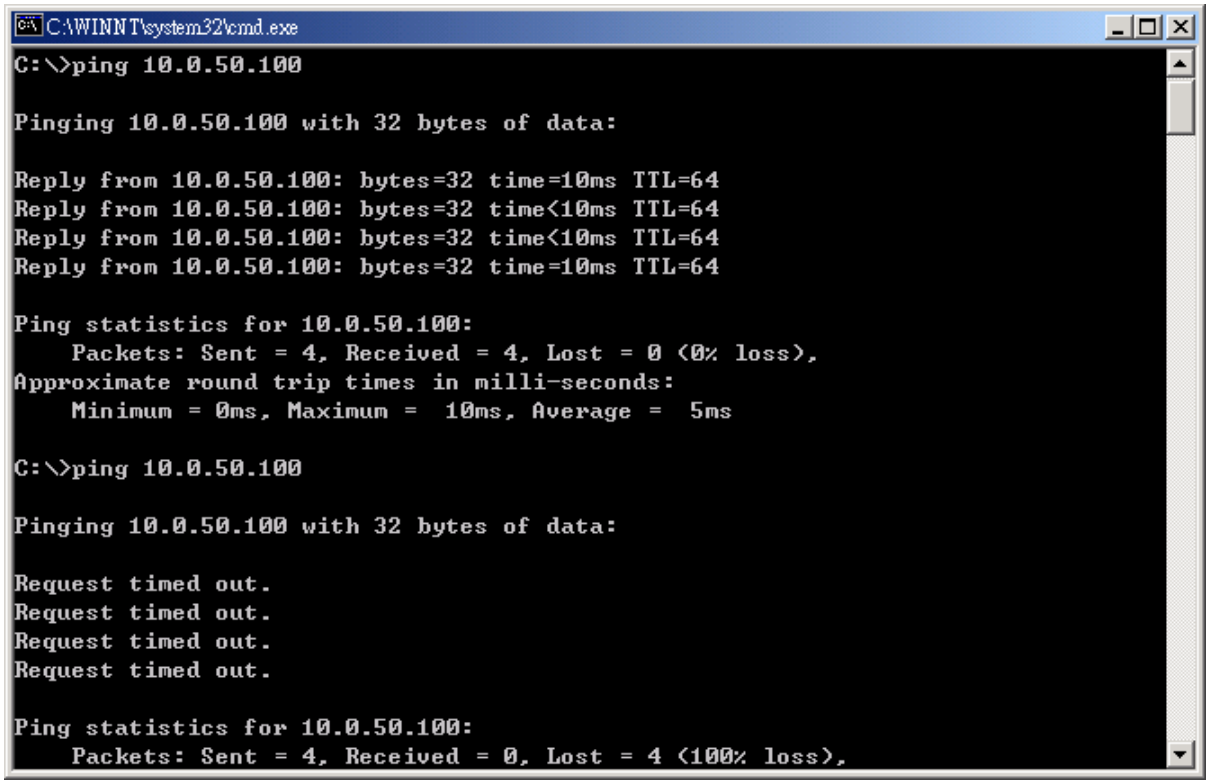
7. Diagnostics

There are several ways you can check on the status and availability of GW21C-MAXI.

7.1 Use Standard TCP/IP Utility *ping* Command

From Windows **Start** menu, select **Run** and type in "**ping <TCP Server IP address>**".

If the connection is established, the Reply messages are displayed, otherwise it will indicate Request timed out.



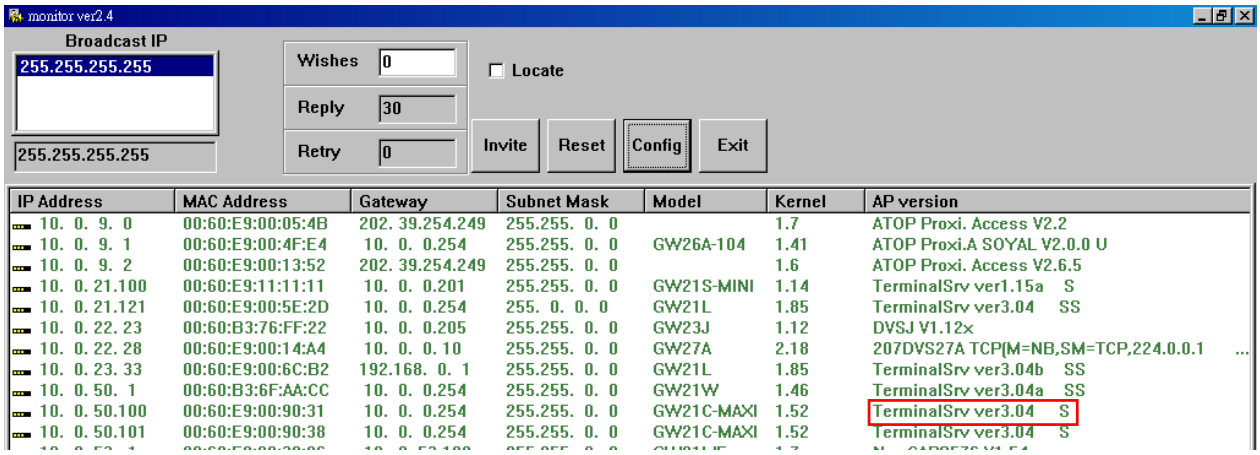
7.2 Use monitor.exe Configuration Utility Program

Use monitor.exe configuration program that comes with the product CD or diskette to check on the status of GW21C-MAXI. The status can be read from "***AP version***" column of the tool.

Status	Descriptions
S	The system is configured as a TCP Server and not yet connected.
C	The system is configured as a TCP Client and not yet connected.
U	The system is configured as an UDP.
A	The TCP Server and is connected.
B	The TCP Client and is connected.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

For example, **'s'** means that COM1 is server mode and is not connected.



7.3 Use TCPTEST.EXE or TCPTEST2.EXE Sample Program

Use sample programs TCPTEST.EXE and TCPTEST2.EXE that comes with the product CD or diskette to check on the status of GW21C-MAXI. Please refer to chapter 6.2 to run the sample programs.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Appendix A: GW21C-MAXI Ethernet-Serial Server Specifications

A.1. Hardware Specifications

	Specifications
CPU	• 16-bit Embedded CPU • 100MHz
Flash Memory	• 512K Bytes
SDRAM	• 512K Bytes
EEPROM	• 512 Bytes
Host Communication	• IEEE802.3 base band • TCP/IP, UDP, SNMP, HTTP, Telnet, ARP, BOOTP
Reset	• Built-in reset key to restore factory default settings
Watch Dog Timer	• 1.34 second hardware auto reset • Power failure threshold: 4.75V
Serial Port Communication	• One RS-232 or RS-485 selectable • RS-232: EIA-RS-232C standard, Full Duplex, 8 pins Mini-DIN or 5 pins terminal block • RS-485: 2/4 wires, Half/Full duplex, 8 pins Mini-DIN or 5 pins terminal • Parameters 1) Baud-rate: 1200 bps ~ 230400 bps 2) Parity: None, Even, Odd, Mark, Space 3) Data bits: 7,8 4) Stop bits: 1,2 5) Packet Delimiter: by inter-character timeout, by characters delin 6) Flow Control: None, Hardware CTS/RTS, Software Xon/Xoff
LED indication	• RUN x 1 (Green) • LAN x 1 (Green) • COM port1 (Green)
Power Requirement	• +9~30Vdc, 2.8 Watt Max
Temperature	• Operation: 0℃ to 60℃ • Storage: -20℃ to 85℃
Humidity	• 20%~90% non-condensing
Housing	• 90mm(L) x 45mm(W) x 63mm(H)

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

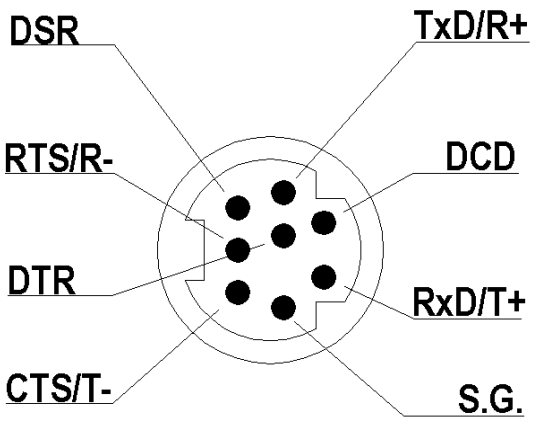
A.2. Software Specifications

Item	Specifications
Protocol	TCP, UDP, ARP, ICMP, SNMP, HTTP, Telnet, BOOTP
Configuration	• Configuration information for both TCP/IP and serial ports is kept in the EEPROM. • Configuration utilities of Windows 95/98/NT are provided for configuring settings.
Internal Buffer Size	• TCP receiving buffer size = 8K bytes • TCP transmitting buffer size = 16K bytes • RS-232/RS-485 receiving buffer size = 4K bytes • RS-232/RS-485 transmitting buffer size = 4K bytes

A.3 Connector Pin Assignments

A.3.1 COM Port

8 pin Mini DIN connector



Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Pin assignments of Mini DIN connector is shown in the following table:

Pin#	RS-232 Full Duplex	RS-485 2 wire, Half Duplex	RS-485 4 wire, Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	**RxD/T+**
3	TXD	**TxD/R+**	**TxD/R+**
4	DTR	N/A (reserved)	N/A
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	**RTS/R-**	**RTS/R-**
8	CTS	N/A	**CTS/T-**
9	N/A	N/A (reserved for Atop devices)	N/A

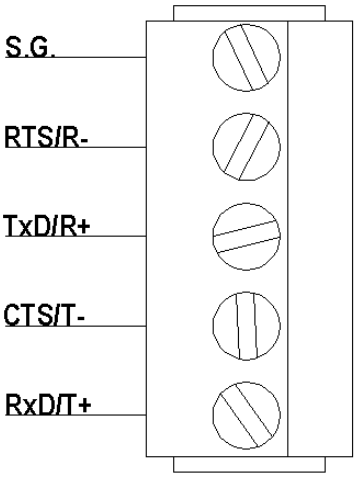
Atop provides Mini DIN connector to DB9 connector cable, the pin assignments of DB9 connector is shown in the following table:

Pin#	RS-232 Full Duplex	RS-485 2 wire, Half Duplex	RS-485 4 wire, Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	N/A
3	TXD	**DATA-**	**RXD-**
4	DTR	N/A (reserved)	**TXD-**
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	**DATA+**	**RXD**+
9	RI	N/A (reserved for Atop devices)	**TXD+**

Note: RS485 2 or 4 pins assignments of DB9 connector are different from those of Mini DIN connector.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

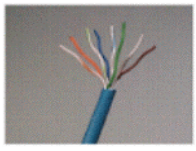
Terminal Block Connector



RS485 only uses RTS/R- and TxD/R+ for data communication while RS232 or RS422 uses RTS/R-, TxD/R+, CTS/T- and RxD/T+ for communicating data.

A.3.2 Ethernet Port (RJ-45)

1. Category 5 UTP cable, 8 core wire.



2. RJ45 Connector.

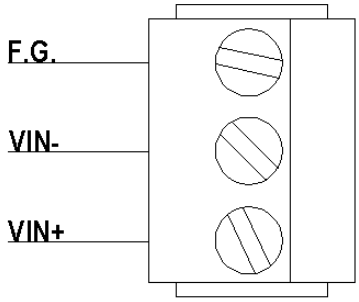
3. RJ45 Pin Assignment

Pin Assignment	568A Definition	568B Definition
Pin1	Green-White	Orange-White
Pin2	Green	Orange
Pin3	Orange-White	Green-White
Pin4	Blue	Blue
Pin5	Blue-White	Blue-White
Pin6	Orange	Green
Pin7	Brown-White	Brown-White
Pin8	Brown	Brown

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

You can choose either 568A or 568B definition. If you want to make a crossover cable, you should use 568A and 568B definition respectively in each terminal of a UTP cable.

A.3.3 Power terminal block connector



A.4 Buzzer/LED Message

Buzzer

“ ^ “: Beep twice

“ = “: Beep off

Message	Description
^===^===^===^===^===^===^... (1sec)	Watchdog problem, return service is required
^^^^^^^^^^^^^^^^^^^^^...	Memory problem, return service is required
^==^========^^ (5sec)	Startup OK but AP firmware is disabled
^==^========^^^ (5sec)	Startup OK and AP firmware is enabled

Table 1. RUN LED Message

LAN LED

Message	Description
LED Off	No data is transmitting on Ethernet
LED blinking	Data is transmitting on Ethernet

Table 2. LAN LED Message

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

COM Port LED

Message	Description
LED off	No data is transmitting on COM port
LED on blinking state	Data is transmitting on COM port

Table 3. COM Port LED Message

RUN LED

Message	Description
LED on	Jumper JP1 pin1 and pin2 are short to disable AP firmware in the flash memory.
LED blinking (rate: 0.5Sec)	AP firmware is running

Table 4. RUN LED Message

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Appendix B. Upgrade System Software

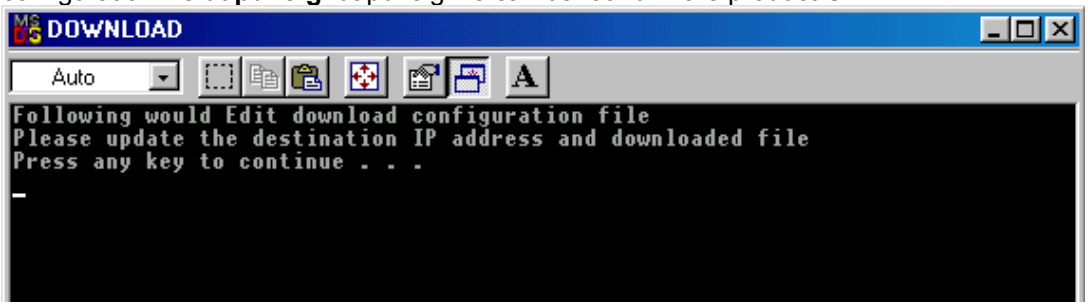
After the new version of firmware is released, customers can download it from Atop web site at www.atop.com.tw. You can contact Atop sales person to request the newest product CD as well.

You may decide to or not to upgrade the system's firmware. To do so, please follow these instructions listed below.

B.1 Upgrade Procedures

When you get a new software version, please follow the sequences below to upgrade your GW21C-MAXI.

1. Connect a PC (Windows 95/98/NT/2000) and GW21C-MAXI you wish to upgrade the firmware in the same TCP/IP network. Use command **ping** or **monitor.exe** utility program to verify their availability.
2. Prepare the download tool. Execute the utility program **download.bat** and press any key to edit its configuration file **dapdl.cfg**. dapdl.cfg file can be found in the product CD.



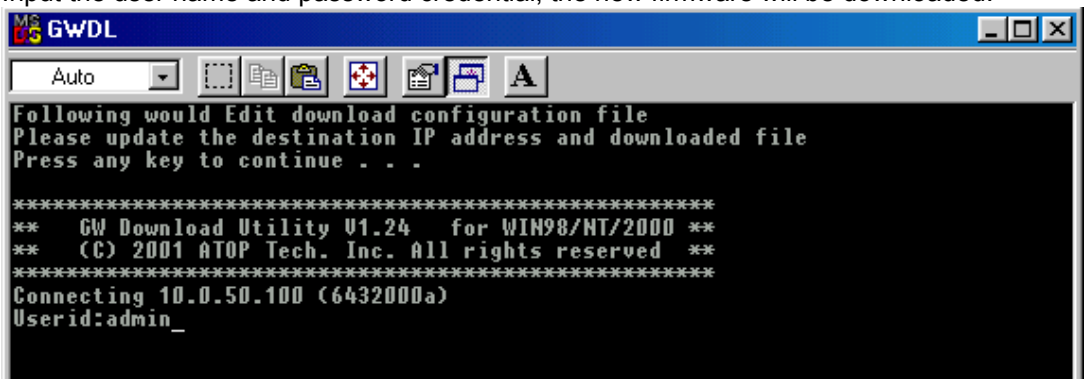
3. Edit the **"dapdl.cfg"** file to fit your system need, the content of the file looks like as the following. Be sure to save your modifications after the change is made.

   Remote_IP 10.0.50.100

   Load U21cmap.hex

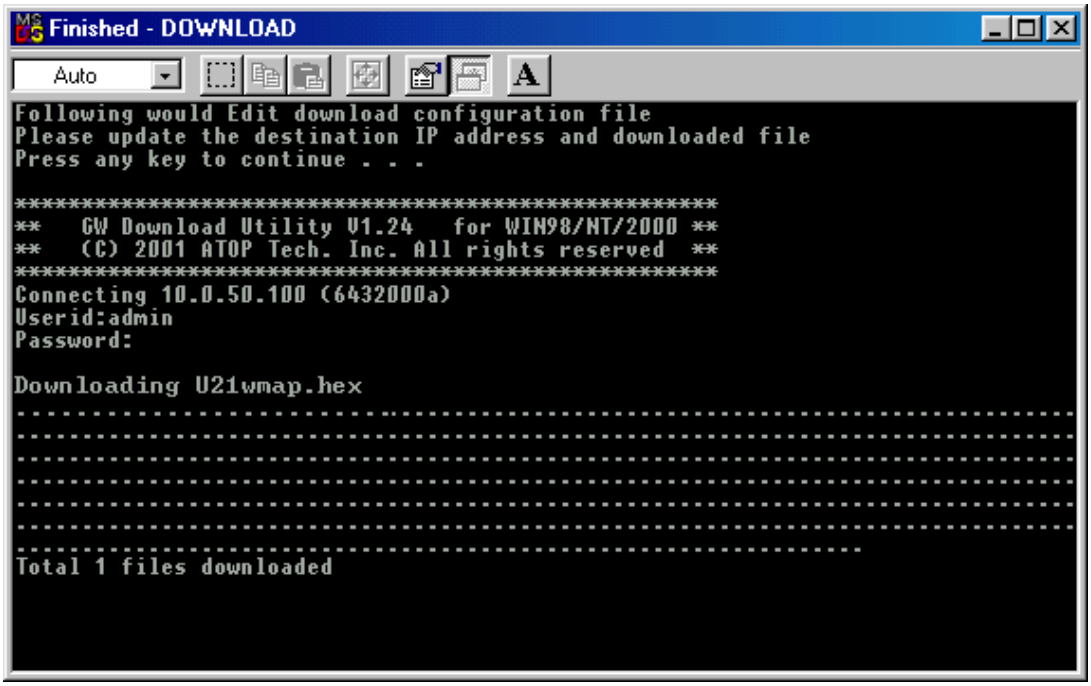
   The first line identifies the IP address of GW21C-MAXI, the second line identifies the firmware (.Hex file) name to be downloaded.

4. Input the user name and password credential, the new firmware will be downloaded.



5. GW21C-MAXI will automatically restart each time the firmware is successfully downloaded.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.



B.2 Critical Issues of Upgrading

1. You can always abort the upgrading process by pressing the **<Esc>** key from host PC during the upgrading process. GW21C-MAXI will restart automatically and the system remains intact.
2. If GW21C-MAXI does not receive any upgrading data within **30 seconds**, GW21C-MAXI will restart automatically and the system remains intact.
3. After the upgrading process finishes, GW21C-MAXI will program the flash memory and buzzer beeps 6 times then restarts. Normally, it takes around 10 seconds to complete the programming process. If an error occurs during the programming process, GW21C-MAXI will clear the corresponding memory and the system remains intact of what it was.

B.3 Error Messages

Firmware upgrade may not be successful if errors occur during the process.

Error Cause	Message	Comments
Illegal Hex file format	Hex File Text Error Hex File Check-Sum Error Hex File Format Error Hex File End of Record Error	
GW21C-MAXI handshaking problem	GW21C-MAXI ACK Start Address Error GW21C-MAXI ACK Length Error GW21C-MAXI Response Command Error	
Configuration file	Remote IP not found Open configuration file failure	

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Appendix C. Hardware Configuration

C.1 Disable System Firmware

The AP (application program) firmware of GW21C-MAXI can be disabled. This function is used in the situation that you downloaded a wrong version of firmware that caused the system crashed.

To disable the current version of firmware and prevent it from executing, please do the followings:

1. Turn the power off, open GW21C-MAXI case.
2. Short pin1 and pin2 of jumper JP1 on the right-top corner from the main board to disable AP firmware.
3. Power on GW21C-MAXI.
4. Download the correct AP firmware to GW21C-MAXI.
5. Remove the pin 1 and pin2 of jumper JP1 to enable AP firmware.
6. Close the case and continue your operations.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

Appendix D Configuration Utility

The configuration utility **monitor.exe** comes with the product CD or diskette is the main utility program to demonstrate and configure GW21C-MAXI's settings.

D.1 Run the utility

Start the program under Windows 95/98/NT/2000 environment and the following window appears.

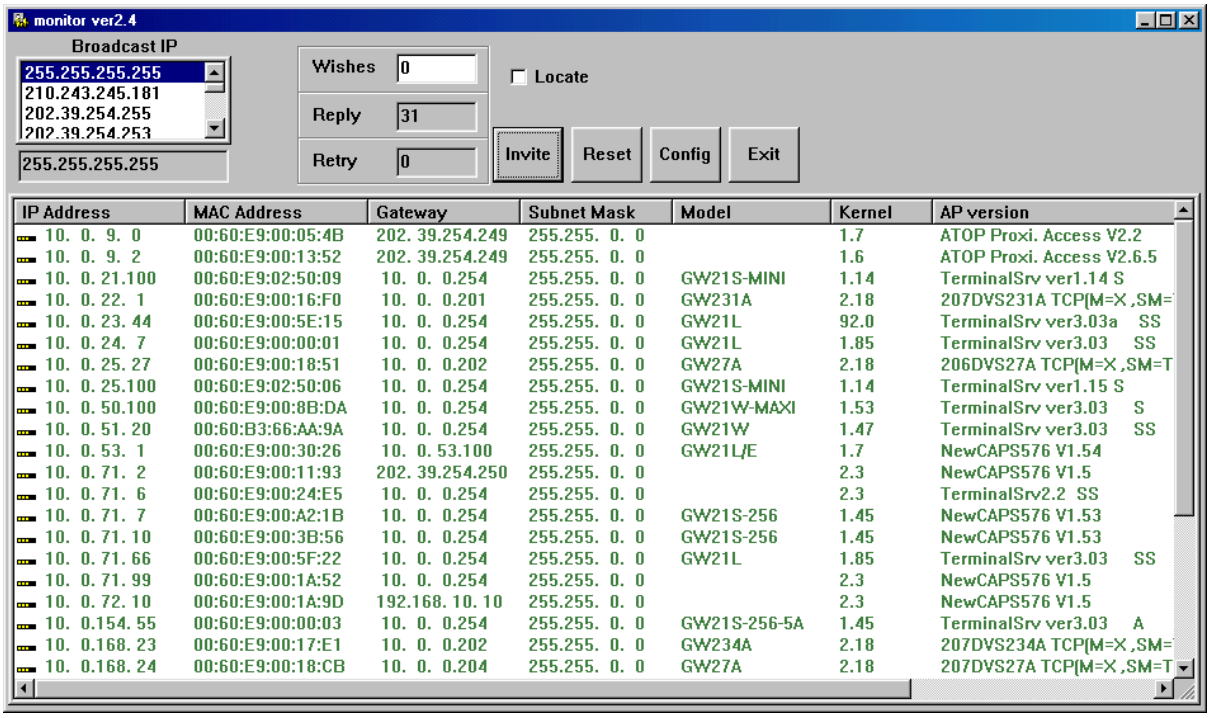


Figure D1. Main window of monitor.exe utility program

D.2 Detect Operational Devices

You may do the following steps to detect devices currently available on the network.

1. Start **monitor.exe** utility program.
2. Select an item from the **Broadcast IP** list.
3. Specify a number in the **Wishes** box.
4. Click on the **Invite** button. This will display all the devices information you have requested.

D.3 Configure Devices

You may use **monitor.exe** configuration utility to configure the settings of devices on the network. To do so, please follow the steps below.

1. Repeat the steps in the section of **D.2** to bring up the devices information.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

2. Select the device you want to configure from the **IP Address** column, click on the **Config** button, a configuration window will popup as shown in Figure D2:

IP Address	MAC Address	Gateway	Subnet Mask	Model	Ker...	AP version
10. 0. 9. 0	00:60:E9:00:05:4B	202. 39.254.249	255.255. 0. 0		1.7	ATOP Proxi. Access V2.2
10. 0. 9. 1	00:60:E9:00:4F:E4	10. 0. 0.254	255.255. 0. 0	GW26A-104	1.41	ATOP Proxi.A SOYAL V2.0.0 U
10. 0. 9. 2	00:60:E9:00:13:52	202. 39.254.249	255.255. 0. 0		1.6	ATOP Proxi. Access V2.6.5
10. 0. 22. 23	00:60:B3:76:FF:22	10. 0. 0.205	255.255. 0. 0	GW23J	1.12	DVSJ V1.12x
10. 0. 22. 28	00:60:E9:00:14:A4	10. 0. 0. 10	255.255. 0. 0	GW27A	2.18	207DVS27A TCP(M=NB,SM=TCP,224.0.0.1
10. 0. 50. 1	00:60:B3:6F:AA:CC	10. 0. 0.254	255.255. 0. 0	GW21W	1.46	TerminalSrv ver3.04a SS
10. 0. 50.100	00:60:E9:00:90:31	10. 0. 0.254	255.255. 0. 0	GW21C-MAXI	1.52	TerminalSrv ver3.04 S
10. 0. 50.101	00:60:E9:00:90:38	10. 0. 0.254	255.255. 0. 0	GW21C-MAXI	1.52	TerminalSrv ver3.04 S

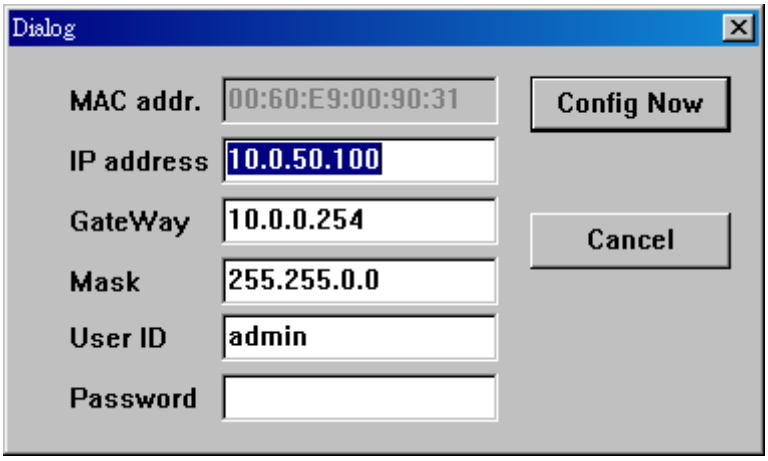


Figure D2. Configuration dialog box

3. After you click the “Configure Now” button, the target device will return an ACK message indicating the modification is successful as shown in the following:

Please note **monitor.exe** version 2.4 and above requires **gw21le.dll** library to function properly.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.

The following table lists the functional descriptions for all the fields.

Field Name	Field Descriptions
Broadcast IP	Except for the default IP 255.255.255.255, other items (IPs) are read from the file "seg.cfg". This field specifies a detecting IP range. It may be a designated IP or a broadcast IP.
Wishes	Specifies minimum number of the devices you wish to get reply from after sending an **Invite** request. If there is not as many as devices responding to your invitation, the system repeatedly sends invitation until your request is fulfilled.
Reply	Indicates the actual number of devices this utility program detected.
Retry	Specify the number of times that an Invite request is re-sent.
Locate	Locate the specified device.
Reset	Reset the selected device.
Config	Configure the selected device.
Exit	Exit this utility.
IP Address	Indicate the IP address of the device that replied to your request. • Leading tag "!" stands for IP address collision, possibly caused by duplicated IP addresses on the network. • Leading tag "?" stands for Mac address collision, possibly caused by duplicated Mac addresses on the network.
MAC Address	Indicates the MAC address of responding device.
Gateway	Indicates the IP address of the gateway.
Subnet Mask	Indicates the TCP/IP network mask.
OS	Indicates the OS version of the responding device.
AP Version	Indicates the AP version of the responding device.
Model	Indicates the model number of the responding device. This field is only available for monitor.exe version 2.0 and above.

Copyright © 2004 Atop Technologies, Inc.
All rights reserved. Designed in Taiwan.